American Perfumer AND AROMATICS

COSMETICS
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SEPTEMBER 1957

THE MAGAZINE OF TASTE AND SCENT

Odor and Vibration . . . Page 43 • Bay Oil . . . Page 51

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COVER: The Chateau Valere in Sion, Switzerland. A bold landmark against the fruit orchards and poplars of the Rhone valley. Photo Courtesy J. P. Rapaz, Laboratoires Aeval S.A., Sion.

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Replica of perfume bottle used in the year 1768

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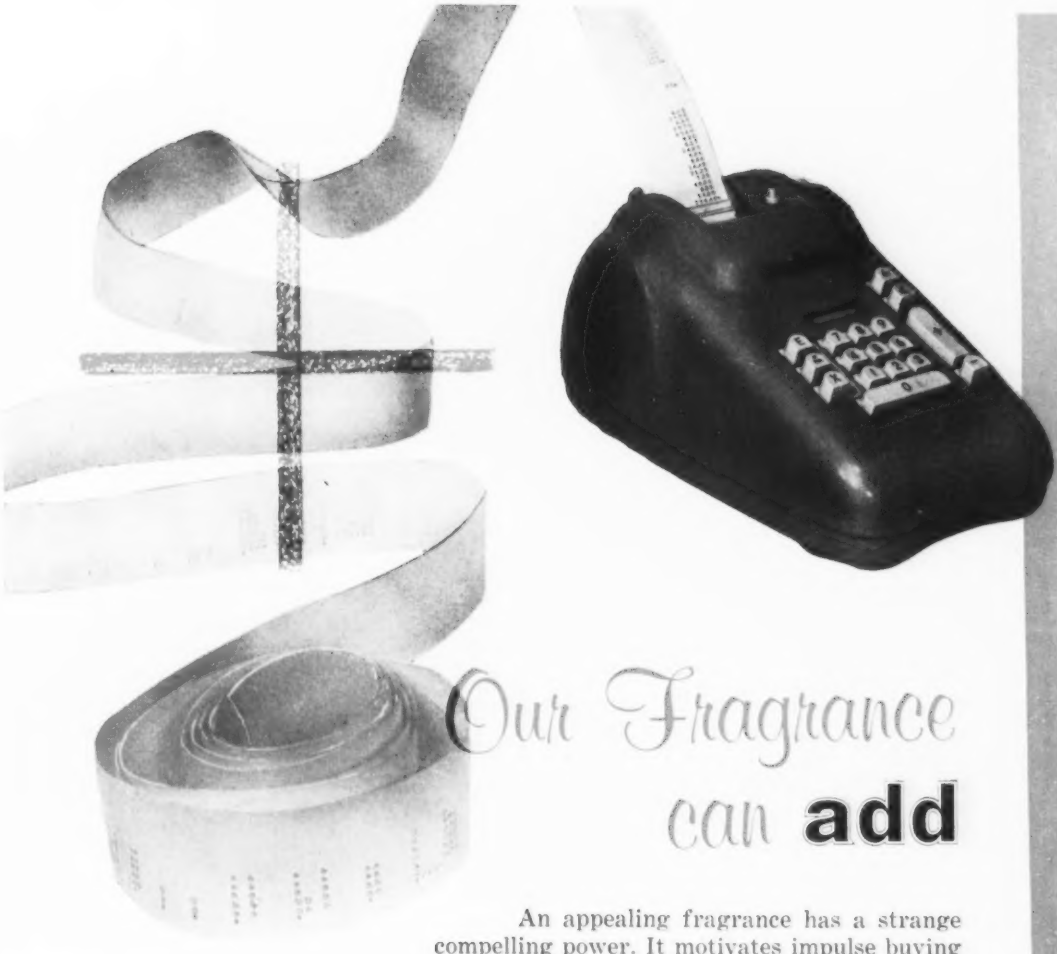

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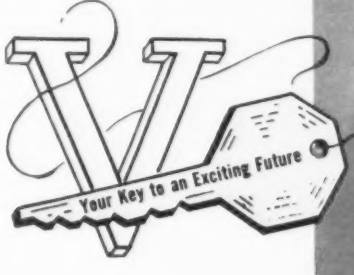

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LAST MINUTE NEWS . . .

Wall St. Journal Spreads Gospel of Aerosol Packaging

In a breezily written and informative two column article starting on the front page of its August 29 issue the Wall Street Journal, which has a wide circulation among business leaders, pointed out the marked advance in the popularity and sales of aerosols, which have swept into perfumes, cosmetics, drugs and other products in the last few years. The article was based on interviews with consumers, manufacturers and packers of aerosols. The popularity of aerosols was attributed to their convenience.

Important Meeting of Fragrance Foundation Sept. 17

Solutions to some of the problems which face the fragrance industry will be explored at the eighth annual meeting of the Fragrance Foundation in the Park Lane Hotel, New York, N. Y., September 17. Members of the foundation and any others concerned with the fragrance industry are to attend. Edward J. Breck, president of John H. Breck Inc. will discuss "When Will a Girl Start Wearing Perfume?" which will be a report on how to reach the expanding teen age market. The morning business session will open at 10 a. m. and will be for members only. At 10.30 a. m. the meeting will be open to non-members. Papers to be read are: "How to Sell Perfume to the People" by Burton Sachs, executive assistant to the merchandising vice president of Bloomingdale's, New York; "How to Sell Women on the Propriety of Wearing Perfume" by Mrs. Catherine Finerty, Batten, Barton, Durstine & Osborn; "Scents and Psychology" by Charles Roth, Ph.D. vice president of John R. Martin Associates; and "The Fragrance Foundation Reports" by Miss Sherry D. Stone, executive director of the Fragrance Foundation. All speakers will participate in an open forum.

College Cosmetic Course at Columbia Starts This Month

The College of Pharmacy of Columbia University will offer a course in cosmetic chemistry beginning this month. The need for the course was established by a survey conducted by the New York Chapter of the Society of Cosmetic Chemists. The course is designed to provide those interested in or already employed in the cosmetic or pharmaceutical industries with the fundamentals of cosmetic technology. Consisting of lectures and laboratory sessions the course will meet one evening each week for two semesters. The curriculum will cover the theoretical basis and practical applications of cosmetic technology and discussions will cover skin area and function, emulsion technology, components or cosmetics and formulation. Prof. Leonard Chavkin is in charge of the course. Anyone interested should contact him at the College of Pharmacy, 115 West 68th St., New York for additional information. Enrollment will be limited to 20 students.

Howard Morgens 46, New President of Procter & Gamble Co.

Howard J. Morgens on October 1 will assume his new position as president of the giant Procter & Gamble Co. He is 46 years old. After graduation from Washington University he completed his studies in the Harvard University Graduate School of Business Administration at the age of 23. His first and only job was with the Procter & Gamble Co. which he joined as a salesman. Then like his predecessor Neil H. McElroy, the 56 year old president who resigned to become Secretary of Defense in President Eisenhower's cabinet, he rose to the top through the advertising department. He did so well that he was made vice president in charge of advertising. Neither Mr. McElroy nor Mr. Morgens ever held jobs in any other company, neither worked outside the marketing end and both were engaged in training young executives.

Twigger Toothpaste in Tablet form Tested in 20 Markets

Sales of 41 million tablets of Twigger toothpaste since it was introduced in 20 test markets last June have been made according to the manufacturer, the Lampar Co., Dallas, Texas. The Lampar Co. was formerly an exclusively ethical pharmaceutical concern. Twigger toothpaste which comes in tablet form is to be nationally advertised and distributed by January 1, 1958.

Program for S. C. C. Seminar Sept. 19-20

The complete program for the fourth annual seminar of the Society of Cosmetic Chemists to be held in the Edgewater Beach Hotel, Chicago, September 19 and 20 have been announced by Seminar chairman Dr. Joseph Kalish. The first session will consider Biological Aspects of Skin and Hair Pigmentation. Dr. Allan L. Lorincz of the University of Chicago School of Medicine will discuss hair and skin pigmentation; Dr. S. William Becker Jr., University of Illinois School of Medicine will discuss "Means of Increasing Skin Pigmentation"; and Norman B. Kanof, New York will discuss "Methods of Decreasing Melanin Pigmentation of the Skin." Laboratory Methods for Product Testing will be considered in six papers. First Dr. Donald H. Powers, session chairman, will introduce the subject. Then Ross Whitman, Rayette Inc., St. Paul, Minn, will speak on "Waving Lotions." He will be followed by Dr. Paul G. I. Lauffer who will present a paper on "Creams and Lotions." H. Henken, Colgate-Palmolive Co. will discuss shampoos and W. G. Fredell of the Lambert Hudnut Div. of Warner-Lambert Pharmaceutical Co. will discuss "Deodorants and Antiperspirants." Milton Schwartz, Revlon Inc. will speak on aerosols. The session on the last day will consider Microscopic Methods. Two papers will be presented: "Capillary Microscopy of the Skin" by Major Michael J. Davis of the Walter Reed Army Institute of Research; and "Some Photomicrographic Techniques for Hair" by Murray Berick of Evans Research & Development Corp. Two plant trips are scheduled for the afternoon.

Detergents and Aspects of Their Examination to be Explored

Papers on detergents and various aspects of their examination and use will be presented at the meeting of the American Oil Chemists Society at the Netherland Hilton hotel, Cincinnati September 30—October 2. Speakers include E. H. Ambruster of the University of Michigan who will speak on "The Effect of Oil Films on the Cleanliness of Surfaces"; R. R. Suskind, of Kettering Laboratory of Applied Physiology, who will speak on "The Effect of Detergents on Skin"; J. K. Weil and colleagues of the Eastern Utilization Research and Development Division of the Department of Agriculture on "Detergent Bars From Salts of Alpha Sulfonated Tallow Fatty Acids"; J. David Justice, of Lever Brothers on some phase of "Water Supply and Sewage Treatment." The related field of measurement of color and fluorescence will be treated by Richard Hunter, who will describe "A New Scale and Instrumentation for Color Measurement"; A. R. Martin, of Whirlpool-Seeger Corp., on the use of "Color Measurement in Practical Detergent Evaluation," and other speakers.

Cosmetic Analytical Methods Theme for Farm Chemists

A direct analysis of nail lacquer solvents that does not require separation of the solvents from other ingredients is one of the new analytical methods to be discussed by cosmetic chemists meeting in Washington next month. This application of gas-liquid chromatography will be presented before the cosmetic and color section of the Association of Official Agricultural Chemists at their seventy-first annual meeting, October 14, 15 and 16. Dr. G. Robert Clark, director of the division of cosmetics in the Food and Drug Administration and chairman of the cosmetics and color section, will preside. A procedure using partition chromatography for the analysis of lipsticks will be described by M. E. Pietrak and S. H. Newburger of FDA. It is suited, to analysis of lipsticks containing either castor oil or oleyl alcohol as the solvent for customarily used halogenated fluorescein colors. A progress report on a continuing study of analytical problems with mascara, eyebrow pencils, and eye shadows will be made by Dr. Paul W. Jewel, of Max Factor & Co. A paper on the application of ion-exchange resin chromatography to the analysis of shampoos containing alkyl sulfate detergents will be presented by Dr. Newburger. The previously mentioned paper on the direct analysis method for nail lacquer solvents will be presented by J. H. Jones, C. D. Ritchie and S. H. Newburger.

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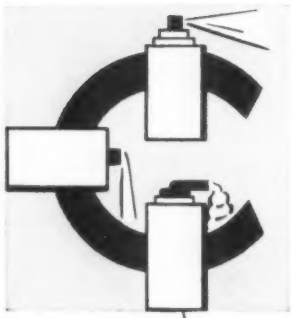

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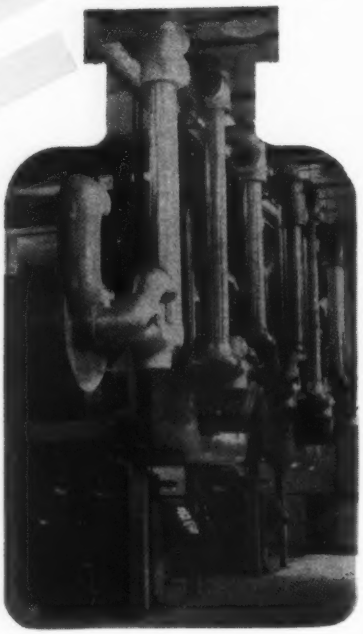

Compressors and refrigeration units.

the new perfumery raw materials completely independent of any natural source

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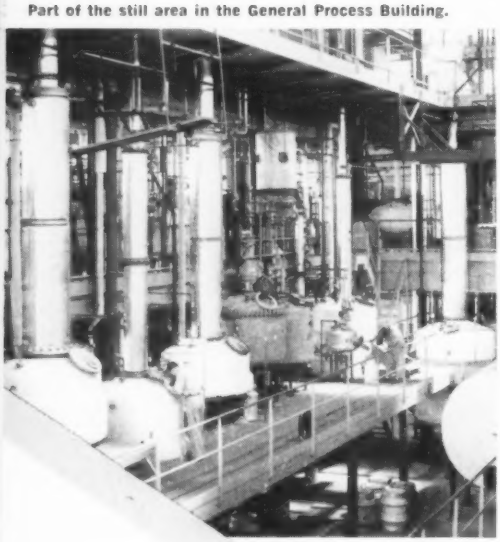

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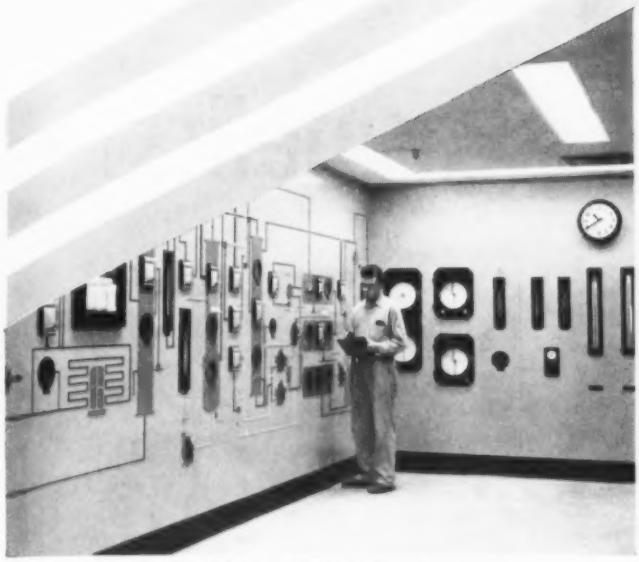

Flow panel for one of the continuous processes.

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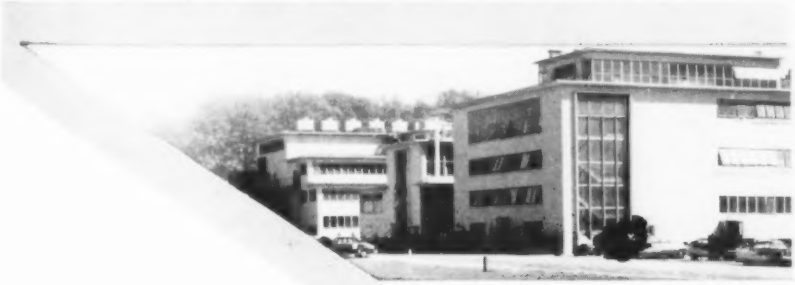

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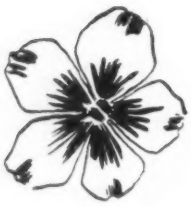

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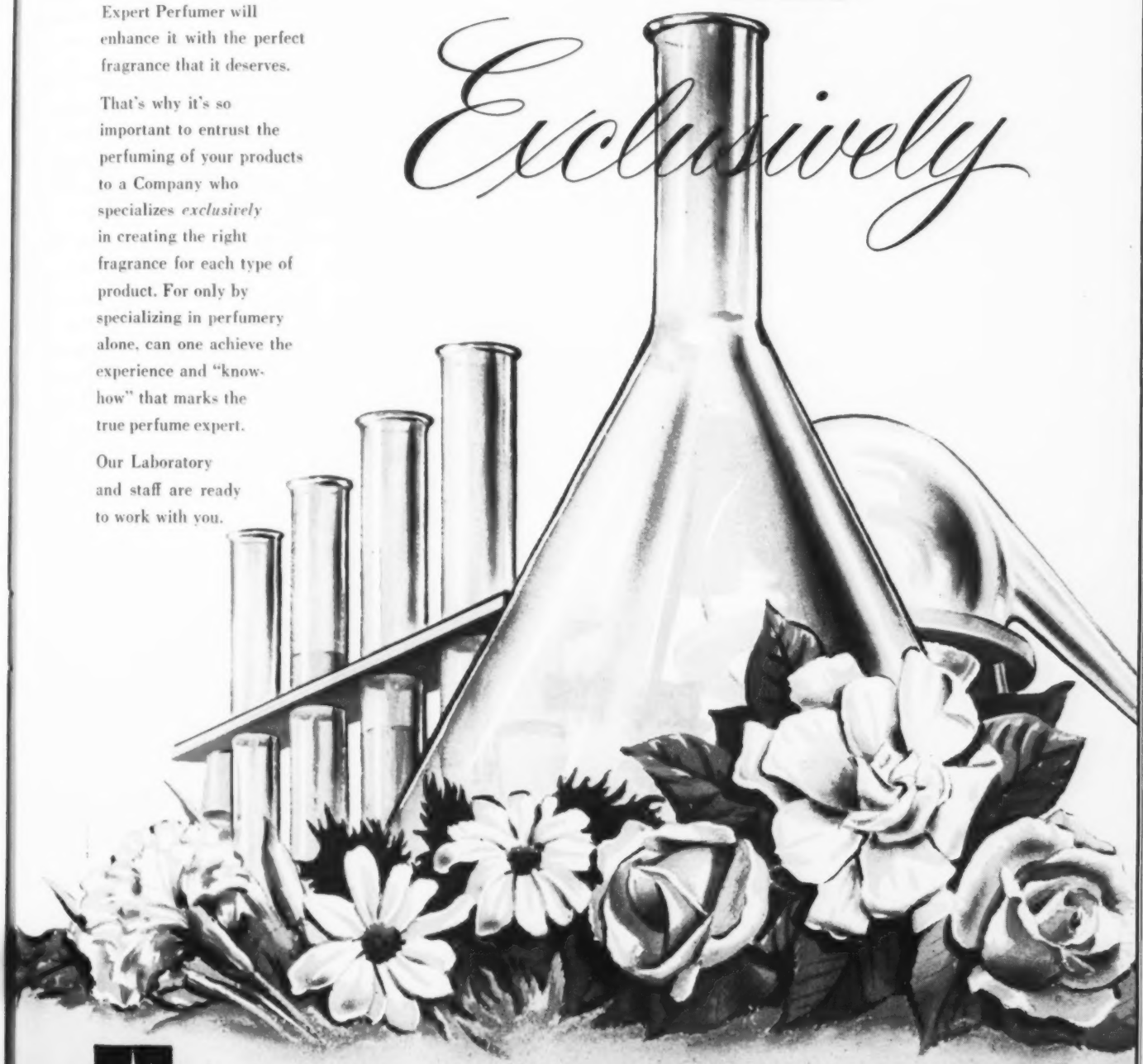

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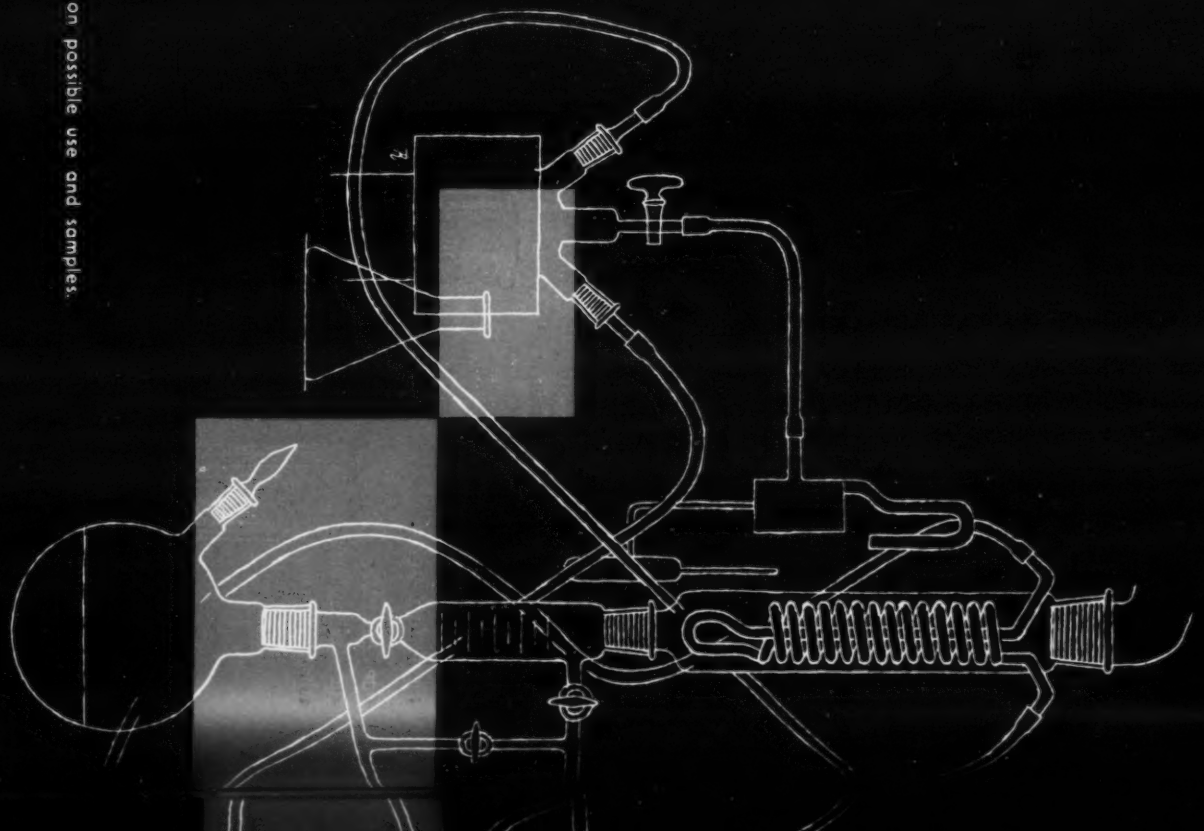

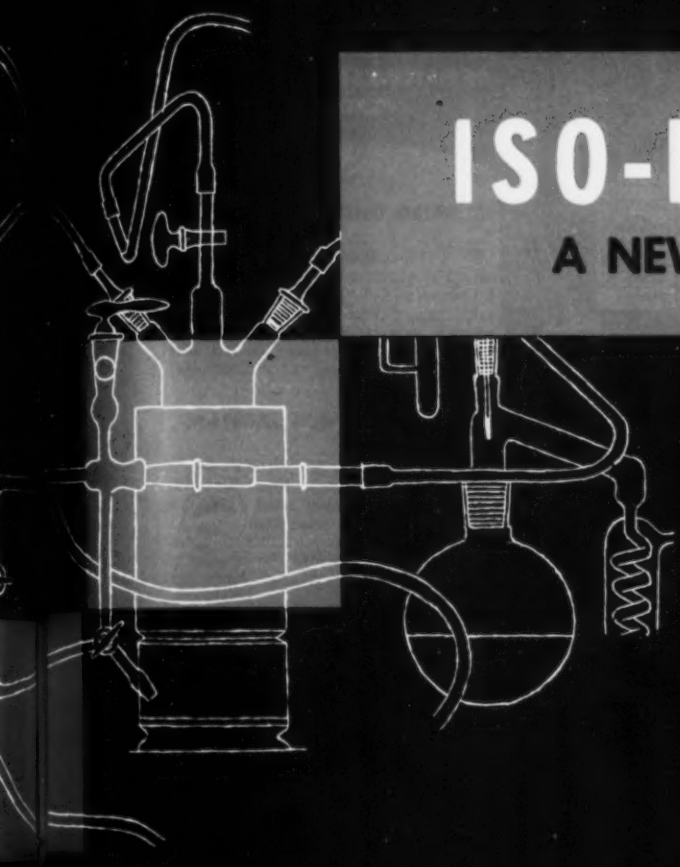

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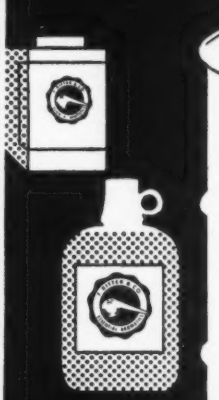

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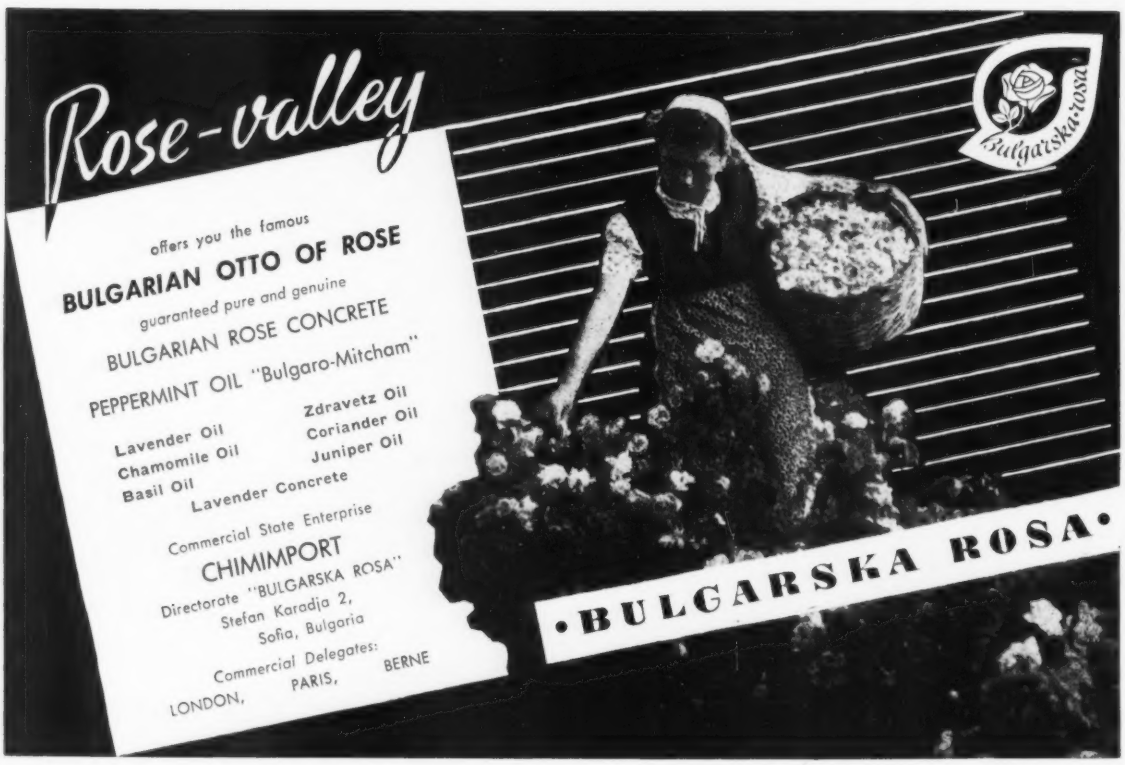

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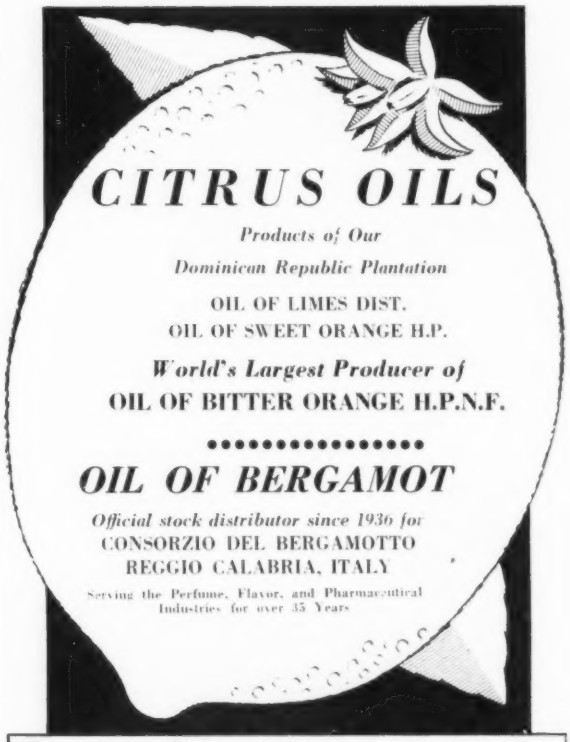
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AERO SCRIPTS

Jack Pickthall*

I am feeling somewhat overwhelmed by the reception given to my humble contribution "Unprotected Glass Aerosols." I have received a surprising number of telephone calls and letters, all I feel bound to say, highly congratulatory. I am writing these notes in the month of May but no doubt there will be developments by the time they appear in print. Most periodicals have given it a mention and several have asked for permission to re-publish.

The "Aerosol Age" editorial is certainly a strong one and I was gratified to see the space given to the review. It has been nice to receive praise from America and I don't mean firms which have irons in the fire. Thanks to Ed deNavarre for his remarks in this journal.

How many uncoated glass Aerosols are sold in America, I just don't know. The last thing I want is to cause concern to anyone in any country. The more Aerosols sold and the quicker the fashion spreads in Europe, the better I like it. But, and there is a but, is it a service to this very important industry to refrain from making what seems to be a fair criticism. Can one balance the saving of a few pence or cents against personal safety? And will the industry be affected if there are accidents which could have been prevented? It takes a long time to build-up a reputation and so little time to wreck it. When, some years ago, we decided to make all our laboratory tests in the actual Aerosol bottle complete with valve, we cautiously found out what happened when the low-pressure bottles were dropped. We were amazed and frankly scared. We had read—without believing—the comparisons made with beverage bottles, but had not anticipated the explosive effects of the breaking Aerosol bottle. Naturally, we wanted to see what could be done to prevent this obvious danger to users and played some part in the investigations on plastic-coatings. However, one of our main concerns was to squash the unreasonable suggestion that the "high-pressure" beverage bottle constituted greater danger than the lower-pressure Aerosol bottle. It was not difficult to show that in theory there was a world of difference between the condition in the two types of bottles.

As most people like to be shown, or to quote my old friend Ed deNavarre, "People believe 20% of what they read and 80% of what they see," we took our lives in our hands and made photographs. These photographs we have presented are not hand-picked or specially selected, they truly represent what happens when bottles with the described fillings are dropped. If we have killed the "beverage bottle" legend, we are pleased; if we have made the Aerosol bottle a safer thing to use, we are happy; if we have caused concern in the American aerosol industry, we are truly sorry.

What worries us is the fact that writers of obvious sincerity and ability have given uncoated low-pressure Aerosol bottles their blessing. I say worries, but I really mean surprises, for I have talked to many fillers and they confirm my results up to the hilt.

I understand that the C.S.M.A. has had the subject under study for several years, but does not appear to have issued a report. I wonder whether they are prepared to give some indications of their findings?

I had noted from the American Perfumer that Robert A. Foresman Jr. was planning to visit Europe to have a look at the Aerosol industry, and I was delighted to receive a letter from Paris suggesting a meeting in London. A really hectic piece of organization was necessary to bring about this meeting.

The week previous I had spent in Geneva at the Symposium on Molecular Structure and Organoleptic Quality. Quite apart from the pleasure of visiting this beautiful City, the papers presented were excellent. No doubt they will all be reviewed in due course and one could not escape the feeling that we have an awful lot to learn about odour. It was a pleasure to meet people like Ruzicka, Arthur and Max Stoll, Naves and a host of other folk, famous in the world of perfumery. At the banquet, Arthur Stoll received his well deserved and considerably overdue honor from Britain.

As I was due in Holland on the following Tuesday, I had one day in which to see Mr. Foresman. By a coincidence

*Chief Chemist, Polak & Schwarz, England, Ltd.

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I had to be in town to help to arrange the reception to the visiting members of the American Society of Cosmetic Chemists, who came to attend the Symposium on "The Biology of the Hair Follicle and Growth of Hair." This particular reception was given by the British Society of Cosmetic Chemists. In the evening I was due at a Society Council meeting. With the help of my friend Fred Riley our Society Secretary, I was able to kill several birds with one stone. Many thanks Fred for entertaining Mr. Foresman. We had an hour's interesting talk, mainly on Aerosols. I formed the opinion that Mr. Foresman found more to interest him in Europe than he had expected and I think he will be back shortly with an extended schedule.

European Market Campaign

The European Aerosol market could do with a full-blooded campaign as there are still very many people who have still to try their first finger-tip dispenser. In the U.K., television has certainly brought home to the public that a new method of using their favorite commodities has arrived. A very short film showing an Aerosol hair lacquer or shave-cream in operation achieves its object in a way that no newspaper approach can do. What is needed is something to get over to the public the general idea of pressure-packing. This is where we could do with a joint effort from all parties interested in the future of Aerosols. Without wishing to speak out of turn, I know that two packing associations in England intend forming Aerosol sections. I wonder how this idea is being fostered in other countries. As stated by the "Aerosol Age" the purpose of the C.S.M.A. campaign will be to "increase the sale and acceptance of Aerosol products with a number one objective of educating the consumer in the convenience, economy and safety of Aerosols." (The italics are my own). If interested parties in our country wish to see their Aerosol products soar to the top, they too must be prepared to put something in the kitty.

Having written the above on one day, I was rather taken aback on the following day to see that the "News Chronicle" had featured Aerosols in no uncertain fashion. In fact, the subject was given one and a half pages. There was a popular feature article headed 'Revolution in the Palm of your hand.' This gave a pointed and well-written introduction to the mode of operation of an Aerosol. A second feature headed, 'New Skills at your Fingertip' gave some of the do's and don'ts in Aerosol use. The page featured a cartoon showing the family at work with a variety of Aerosols and invited the completion of a limerick, prizes being offered for the best effort. The page contained advertisements for insect sprays, shave-creams, moth proofers and contract loaders.

On the half page there was another section under the heading 'The Press Button Miracle.' This was a condensed indication of the products which are already being packed in Aerosol form. This section also carried several advertisements for room deodorants, insecticides etc.

For a popular article, the whole thing was extremely well done and it seems obvious that they have been guided by an expert in the field and my bet is that this expert is connected with a supplier of metal containers because glass aerosols and the products which are sold therein were conspicuous by their absence, except for one very small paragraph which simply indicated that they did in fact exist.

College Courses in Aerosol Technology

The tremendous importance of this Aerosol industry in America is underlined by the fact that the University of California Medical School and the Philadelphia College of Pharmacy and Science are to institute courses in pressurized packaging. Such courses obviously can only be contemplated if help from propellant, valve, and container manufacturers, fillers and a host of other interested parties is forthcoming. To the best of my knowledge, apart from a few lectures, our only effort has been to include "Aerosols" in the syllabus of the third year (Diploma course) at the Acton Technical College. This final year deals with a variety of subjects hinging around the cosmetic industry and includes, cosmetics, emulsions, powders, perfumes etc. The lecturers are all experts in their own particular subject and the successful candidate receives the Diploma of the Society of Cosmetic Chemists of Great Britain which sponsors the course.

Talking of our Society of Cosmetic Chemists, which is so closely associated with the American equivalent, brings me once more to Aerosols. At the annual general meeting, Mr. Dobson the retiring president, gave as his presidential address, a fine paper named "Marketing Trends." In his paper he gave interesting figures which made it possible to forecast the money available for cosmetics in the Western European countries. In the main, he used the U.S. as his yardstick of possibilities, and forecast that tomorrow's successful items in Europe will be those already established in America. Whilst I must not quote too generously from Mr. Dobson's speech, which will be printed in due course, I must say how pleased I was that he gave so much space to pressurized packages. In his rather unique position to see both European and American markets, his opinions are valuable. He was a little critical of the presentation in metal containers and thought they could be improved from the point of eye-appeal. From a cosmetical point of view, he thought glass containers offered more scope but expected great things from nylon and polyethylene containers.

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DESIDERATA

Maison G. deNavarre, F.A.I.C.

On the Interference of Ethoxylated Nonionics with Preservatives

My sixth paper on this subject, given before the joint meetings of the Swiss Society of Cosmetic Chemists and our own, covered the entire study of this five-year project. A statement made after the paper was given, said in effect that bacteriostats were being tested against fungi and the results were not valid . . . that the results would probably be different if fungicides were used.

Perhaps, but I doubt it so long as hydrogen bonding can take place. The main preservatives tested were the *p*-hydroxybenzoates; sorbic and dehydroacetic acids and ethyl vanillate. So, let's examine the facts.

Pearl has reported in the AMERICAN PERFUMER AND AROMATICS (July, 1950) that ethyl vanillate was inhibitory against *A. niger* in a concentration of 0.09 per cent and seven other fungi in concentrations from 0.1 to 0.3 per cent.

Gooding (U. S. Patent No. 2,379,-294), Etchells and Melnick with others have reported in many publications on sorbic acid as a fungistat for foods.

Numerous publications by Boehm, Sabalitschka (U. S. Patent No. 1,627,342) Schimmel and Husa and Aalto, *et al.*, to name a few, have reported on the antifungal properties of *p*-hydroxybenzoates finding the methyl ester as an inhibitor in concentrations of 0.1 and less.

Shibasaki, Terui, Winkler (U. S. Patent No. 2,722,483), Von Schelhorn and The Dow Chemical Company literature cover the use of dehydroacetic acid as a fungistat in concentrations of 0.007 to 0.5% depending on pH. Indeed, it was considered for use in cheese wrappers for this purpose until FDA turned it down.

Now I ask you, are these fungistats or not? Fungicidal properties were never claimed for these materials although they may possess them.

We have tried di- and hexachlorophene. They have fungistatic and fungicidal properties. Other pharmaceutical fungistats have been tried, such as OPP, PCMX, bithionol, benzoic and chlorobenzoic acids, and chlorophenesin.

All end up being inactivated to varying degrees by ethoxylated nonionics. It hurts to find this out, but that shouldn't make us blind to the facts.

One comment passed in the halls after I gave one of these papers was, "Heck, if he used formaldehyde, there would be no problem." Well, I haven't tried formaldehyde myself, but two well qualified people in London told me they had. It too was inactivated in their tests using three fungi and three bacteria. When these people told me how much work they had done on this problem, I was flabbergasted. They have gone much farther than I have so I hope they publish something on it.

The number of people who have encountered spoilage of products containing nonionics and sufficient preservative are greater than anyone knows. The data is sometimes uncovered only after considerable prodding.

I would like to stress here that all nonionics have not been tried. Only forty odd common ones, not all ethoxylated, (each type included) were used. Most common preservatives have been tried. Not all of them. A few new fungicides will be tried and the results will be reported later.

At this time, we translate a 2 plus (+ +) or moderate growth in laboratory tests as being the minimum required to be noticeable in a commercial product so that it would be recognized as spoiled. The length of time needed to find such spoilage will vary widely among toilet articles, depending on composition, factory cleanliness, contamination of raw materials and finished product as well as the conditions of light and heat during "incubation." Products with high oil content would be the least affected.

One skeptical Britisher gave me quite an argument pointing out that he had never experienced trouble with nonionic cosmetics if they were properly preserved. A letter from him just came in saying "after our dinner conversation, I examined 24 samples of a batch made about 18 months ago, but fortunately not

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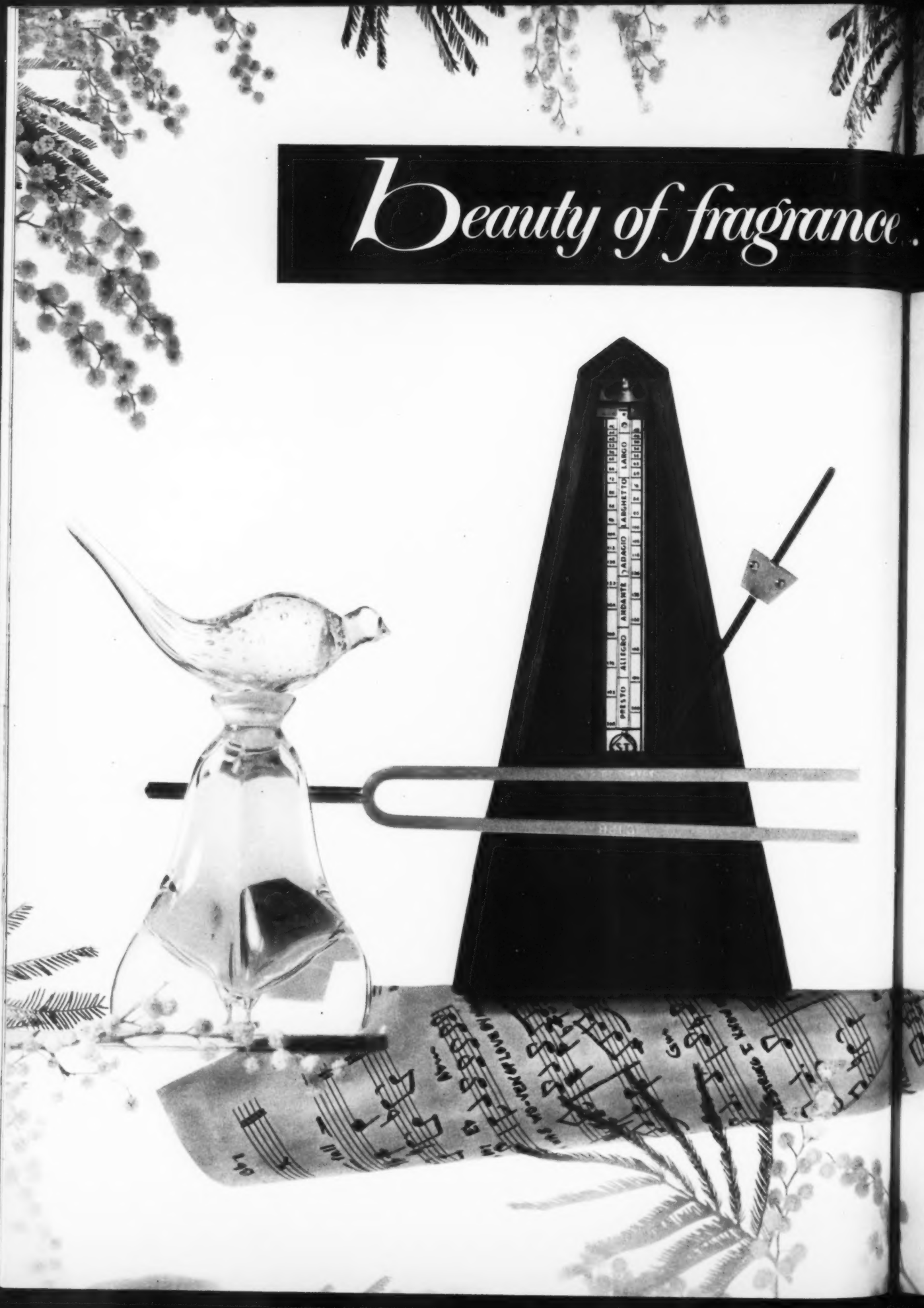

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put on the market. Over 25% showed pronounced growth." No further information as to the nonionic or preservative used or the type of growth was contained in the letter.

One man told me in London that we should practice pharmaceutical sanitation so that our preservative would have little work to do. That is a good viewpoint.

Now, all we have to do is to find a way of preventing the inactivation of preservatives by ethoxylated nonionics.

Safety of Hormones in Food

Shades of earlier Delaney hearings! Briggs' writing in the July 27th J.A.M.A. finds that the use of hormones in beef cattle and poultry to improve weight gain and feeding efficiency creates no hazard to people eating the meat. Only people eating large amounts of liver, kidney or other organs from hormone treated animals would have a problem. Most of us go easy on these anyway.

New Humectant

All the problems with ethoxylated nonionics notwithstanding, a new humectant made by adding 2.5 moles propylene oxide to glycerin has just become available. It is soluble in water and alcohol. It has an equilibrium hygroscopicity at 24°C., and 55 per cent relative humidity of 8.4 per cent water in solution. It can be used in place of glycerin and other polyols. It has a low acute oral toxicity. Skin contact is OK, too. Absorption through the skin is no hazard. The stuff is as thick as glycerin or less perhaps and has a light amber color and pleasant odor.

Notes

Liked Commissioner Larrick's statement read in London regarding cancer and food additives—Let's not go off half cocked on the subject . . . . Freddy Wells has a new place to take Frank Chilson for dinner in London . . . The honored and respected LA PARFUMERIE MODERNE closes shop with the November-December 1957 issue . . . . An international federation of societies of cosmetic chemists was discussed in Paris . . . . Got a few compliments and one dig on my "Encyclopedia" while in Europe . . . . Bob Kramer can become a travel agent now—he has plenty of experience. . . . Maybe you can't drink beer up in the Alps, but I've enjoyed plenty of it at five and eight thousand foot levels in the U. S. Rockies. . .

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QUESTIONS & ANSWERS

1252: POWDER POLISH

Q. *I would like to know the ingredients of Cutex Powder Polish of which I send a small sample. I am assured by some that it is simply jeweler's rouge powdered but that is a much darker red. This powder has a slight fragrance and a pinkish color. The powder is insoluble in HCl (no effervescence) and the color does not seem to be soluble in water. I think it may be pumice mixed with rouge, but I have not been able to reproduce the color. As I understand it, Cutex has discontinued this powder but there is still a demand for it here. Any help you can give me will be sincerely appreciated. K.C.D., Tennessee.*

A. Naturally we are not able to give you the ingredients of Cutex Powder Polish for we do not know them. We can only tell you that the literature shows formulas for nail polish powder of the past to have consisted principally of tin oxide. To this has been added a small amount of talc, sometimes starch, tint and perfume. It is entirely possible that wax may be added to some of these in one form or another and of course other mild abrasives could possibly be used as well.

1253: ZINC STEARATE

Q. *Recently I read in a French perfumery review an article about the use of zinc stearate in face powder. According to this article, it is considered bad for the skin in the United States. I would like to know if there is a regulation on this product in your country.* C.R.M., *Portugal*

A. Zinc stearate is used in face powder in the United States and there are no regulations against this. Zinc stearate as such is not used in baby powder because of the tendency towards bronchial asphyxiation from the fine powder, should a child take a box of the powder and shake it in the air.

1254: HAND CLEANER

Q. *Can you give us a formula for a waterless type of hand cleaner paste?* D.J.C., *New Jersey*

A. The following is a formula for a waterless type hand cleaner paste.

Emulsifier WHC	12.5
H_2O	43.5
Deodorized Kerosene	44

Warm emulsifier and water to 70C°., and slowly add kerosine while stirring rapidly. Lanolin and other emollients may be added.

1255: CAKE MASCARA

Q. *We wish to produce cake mascara and waterproof liquid mascara and would like to know what type of mascara is most popular in the United States and the typical formula. In our country shellac type liquid mascara is more popular than cake mascara. We think ethylcellulose type liquid mascara is better than shellac type.* C.M.K., *Japan*

A. Cake mascara is far more popular in this country than is any liquid or paste type. Keep in mind when formulating that the material must be easily removed by washing. It is doubtful if ethycellulose will work this way. Shellac can be partly solubilized, and therefore, removed. Ethylcellulose is water insoluble, as you know.

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Odor and Molecular Vibration

A New Theory of Olfactory Stimulation

R. H. WRIGHT, C. REID and H. G. V. EVANS*

THERE is at the present time no generally accepted theory of olfaction, that is, of the process by which the nose can instantly detect as little as 2×10^{-12} g. (*ca.* 2×10^{10} molecules) of a substance like ethyl mercaptan when dispersed in 50 c.c. (6×10^{-2} g., or 3×10^{19} molecules) of air. What is equally remarkable is the ability of the nose to identify, as well as detect, the substance at the same low threshold concentration.

Reference to recent reviews of the literature by Nerdel and Spaeth[1] or Jones and Jones[2] discloses a wide variety of asserted correlations between odour and other molecular properties, and an almost equally wide variety of triggering mechanisms, but it is noteworthy that all attempts to correlate odours with specific chemical structures have been unsuccessful, and, as far as we are aware, no physical property other than low-frequency molecular vibrations can be so correlated. Because of the lack of chemical correlations, it is agreed generally that odour is a "whole-molecule" effect, and that the contributions of specific groups are generally subordinate to the overall architecture of the molecule. The low-frequency vibrational modes of a molecule are also a "whole-molecule" property in exactly the same sense of the term, and contrast markedly with the higher frequency vibrations which are largely located in and characteristic of particular chemical bonds. There is, therefore a certain *a priori* plausibility in seeing low-frequency molecular vibration as the physical basis of odour.

It is clear that a complete theory of the olfactory process must account for both the sensitivity and the selectivity of olfaction, i.e., it must explain that which initiates the nervous impulse as well as that which distinguishes one odour from another. There is a strong tendency for the various theories to reflect the predilections of their proponents, and few of the suggested mechanisms would be equally acceptable to a neurophysiologist and to a physical chemist. A possible exception is a recently proposed "information theory" of olfaction put forward by Hainer, Emslie and Jacobson.[3] These writers have considered the nature of olfaction in terms of subjective olfactory experience, the neurophysiology of the olfactory system, and the requirements for the storage and transmission of information. The resulting theory provides a plausible account of many puzzling phenomena of olfaction such as fatigue and adaptation and the well-known difficulties of classifying odours. It can also be made to account for the fact that the intensity of the olfactory sensation is proportional to the logarithm of the concentration of the odorous substance, i.e., for the Weber-Fechner Law. On the other hand, their theory does not attempt to explain the primary mechanism of olfactory stimulation in which the odorous molecules interact with the olfactory end-organs so as to initiate nervous impulses.

One of the objections to the hypothesis that odours have their origin in the vibrations of the odorous molecules has been the fact that no mechanism has been suggested hitherto which would explain how the rather small quanta associated with vibrations in the far infrared might trigger the energetically much larger discharges of energy associated with a nerve impulse. The purpose of the present paper is to show that such a mechanism can be conceived, and that it is consistent with the facts of olfaction as well as with accepted physico-chemical principles and the neurophysiology of the olfactory system. It also turns out to be broadly consistent with what is known of the mechanism of visual stimulation.

For purposes of review, the most important of the relevant facts may be recapitulated as follows:

(i) To produce a perceptible odour, molecules of the odorous substance must make a close approach to the olfactory end-organ;

(ii) To induce an olfactory sensation, the air in the nasal passage must be moving;[4,5]

(iii) The odours of substances have not hitherto been securely correlated with any of the chemical or physical

*British Columbia Research Council, University of British Columbia, Vancouver, 8, Canada. Reprinted from Chemistry and Industry, September 22, 1956 pp 973.

properties of their molecules, but there are indications that the odour may be connected with the low-frequency molecular vibrations which also give rise to infrared absorption in the region of the spectrum beyond about 15-20 μ and to Raman shifts below about 600 cm.$^{-1}$;[6, 7, 8]

(iv) The olfactory end-organ may be described briefly as follows. The neural cells, which extend through the cribriform plate from the olfactory bulb of the brain into the nasal passage, are elongated bi-polar cells each of which terminates at its outward end in an enlargement called the olfactory vesicle. The vesicle carries from 6 to 12 protoplasmic filaments or hairs which are integral parts of the cell. Their diameter is of the order of 0·1 μ and their length may be 1-2 μ, although on account of their fragility this point has probably not been fully established. It is not known whether these hairs make direct contact with the air in the nasal passage by extending through the mucolipid film which bathes the olfactory epithelium, or whether they terminate in that film.[9, 10] The hairs are unprotected extensions of the actual neural cells, so that olfaction is exceptional among the senses in that it involves an extremely direct interaction between the neuron and the source of stimulation. It has been remarked often that the structure of the olfactory end-organ is so simple that it affords no clue to its mechanism. We would point out, however, that its structure is admirably designed to permit very close approach of the odorous molecules to the olfactory cell membranes. Because of this, a mechanism depending on a very low energy input, such as would be provided by a molecular vibration, is quite plausible;

(v) In man there are about 50,000,000 primary olfactory neurons. These carry the olfactory hairs at their distal ends, and proximally they lead into the olfactory bulb which is a region of great structural complexity. About 45,000 nerve fibres lead out of the olfactory bulb to the brain, but these 45,000 are grouped in bundles of 24 which are connected to some 1900 glomeruli located in the olfactory bulb.[11] Hainer, Emslie and Jacobson[3] regard these glomeruli as being in the nature of "exchanges" and suggest that there are 24 types of primary neuron responding to differing stimuli and feeding the 24 secondary or cerebral neurons which emerge from each glomerulus. This provides a very large number of possible digital patterns (more than 16,000,000 configurations if all the possibilities are enumerated) and constitutes the "informational" basis of our ability to discriminate a very large number of odours;

(vi) The existence of olfactory end-organs which respond selectively to differing stimuli has recently been demonstrated experimentally by Beidler and Tucker.[12] Using an *in vitro* preparation of olfactory epithelium (opossum) from which electrical recordings could be made from very small bunches of nerves, they found that one fibre may not respond to a given odour as well as another fibre, although this relationship may be reversed if a different odour is chosen;

(vii) Nerve cell walls in their normal state are the site of an electrical double layer. The initial even in nervous stimulation appears to be a localized breakdown or discharge of the layer which is accompanied by an alteration in the permeability of the cell wall. The discharge is propagated along the nerve as a pulse of approximately 1 millisecond duration. The magnitude of the pulse does not reflect the odour intensity: the neuron either transmits a pulse or it does not in accord-

(viii) The olfactory epithelium is coloured a more or less dark yellow-brown by the presence of the "olfactory pigment." The constitution of this pigment is unknown and its precise location is described somewhat ambiguously in the literature. However, Heusghem and Gerebtzoff[13] report that in the rabbit, pigmented lipids are situated partly in the peripheral prolongations of the sensory cells and partly in the glands of Bowman.

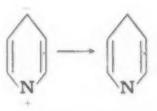
The following theory embraces all the foregoing observations. In general, a pigmented molecule is one whose structure involves extensive conjugation or the presence of "chromophoric" groups which result in the presence of weakly bound electrons. These electrons may be excited by the comparatively small quanta of light in the visible region, and it is this absorption which produces the characteristic colour of the pigment. Similar excitation of these electronic levels may also be brought about by chemical means. The return of the excited electrons to the ground state can occur only with the release of the energy which was provided to excite them. The authors suggest that the molecules of the olfactory pigment located in the end-organ can be electronically excited by metabolic processes capable of supplying the necessary energy. The fact that they are coloured shows that the pigment molecules have excited electronic states of lower energy than their neighbour molecules. They might act, therefore, as energy acceptors[14, 15] and so their excitation presents no difficulty. The de-excitation of these pigment molecules may then provide the re-distribution of charge necessary to effect the breakdown of the membrane potential, which is the primary process usually thought to initiate a nervous impulse.

Because of the known pigmentation of the olfactory end-organ and because of the known ability of coloured molecules to act as energy traps,[16] it has been thought reasonable to attribute the triggering function to the pigment molecules. This is by no means mandatory, however, and it may be that this pigment (like so many others) is part of the energy-supplying oxidation-reduction mechanism, in which case the triggers could be provided by the associated protein. But by analogy with the visual process where a pigment (perhaps of very similar constitution to the olfactory pigment) certainly provides the excitation mechanism, our assumption is quite reasonable. It is also possible that the vibrationally triggered electronic step might consist of an excitation rather than a de-excitation as we have supposed This would be closer to the visual process, but on the whole the triggered de-excitation seems to be more plausible although very little is known about selection rules for chemical excitation.

The electronically excited state of the trigger molecules may be reasonably assumed to be more polar than the ground state, so that the transition might involve a change of the type represented by:

$$>\dot{C}-\bar{O} \longrightarrow >C=O$$

or



or, [17] $R_2\dot{N}=CH-CH=CH-CH=CH-\bar{O} \longrightarrow$

$$R_2N-CH=CH-CH=CH-CH=O$$

Many changes of this sort are known, and the above are given merely as examples.

Such a change taking place in the oriented layer of the cell wall could produce a local discharge of the membrane potential of the type required to initiate a nervous impulse. In the extremely minute olfactory hairs the discharge of a relatively small number of such molecular dipoles might be sufficient to outweigh the process of

metabolic reactivation and thereby produce a local depolarization sufficient to initiate a nervous discharge. It is the task of the authors to show how this deactivation of the pigment molecules might be triggered by the close approach of odorous molecules capable of vibrating with a suitable frequency.

The return of the excited molecules to the ground state may occur quite easily by radiation in which case the transition is said to be "allowed." Alternatively, it may take place only after some delay, in which case it is said to be "forbidden" because the process has a lower probability than that which governs the "allowed" transition.

An electronic transition of the type postulated is "forbidden" when the transition moment integral is zero, i.e., when,

$$\int_{+\infty}^{+\infty} \psi_u M \psi_l \, d\tau = 0$$

where ψ_u and ψ_l represent the wave functions of the system in the upper and lower states respectively, M is the dipole moment operator, and the integration is over all space. This may occur because the part of the integral from $-\infty$ to 0 is equal and opposite to the part from 0 to $+\infty$, as a consequence of the symmetry of the system. The probability of such a "symmetry forbidden" transition may be profoundly altered by the simultaneous excitation of asymmetric vibrations, and one conceivable triggering mechanism might be based on this fact. Resonance between the vibrations of the odorous molecule and the receptor pigment might result in a change of population in the vibrational levels of the electronically excited state. If the shift were into a vibrational level from which the transition to the ground state is more "allowed," than a local discharge of the cell membrane might result. This would imply a specific "cooling" of the pigment by the odorous molecules. Recent work[15] has established such long vibrational relaxation times in certain cases (up to 10^5 or 10^6 collisions) that high specificity in vibrational deactivation is not unreasonable. However, these observations relate in general to higher vibrational modes (usually above 1000 $cm.^{-1}$) and might not be relevant for "whole-molecule," low-frequency vibrations with which we are concerned here. Moreover, even assuming the most favourable ratio for the relative effectiveness of the odorous molecules to that of the non-odorous air molecules, it is found that for a threshold concentration of the odorous substance of 10^{-9} mol. mol., the signal-to-noise ratio would be extremely low, about 10^{-5}, because of the non-specific cooling by the air molecules.

On account of this objection, the authors favour an alternative mechanism which has the advantage of being highly specific to the odorous molecules so that they are not subject to any competition from the air molecules.

Referring to the expression for the transition moment integral, if when ψ_u is finite ψ_l is zero, and vice versa (i.e., if there is no "overlap"), then the expression will always remain zero and the transition will remain "forbidden." An "overlap-forbidden" transition may become more "allowed," however, if a perturbing influence sufficiently alters the vibration frequency so as to produce a certain amount of overlap between the ground and excited states. It is postulated, therefore, that the transition probability of the electronically excited pigment molecules may be significantly increased by a shift in their vibration frequency brought about by a process akin to Fermi Resonance between the odorous and receptor molecules. The Fermi Resonance process occurs in the general case when two different vibrations are "accidentally degenerate," i.e., when they have the same or nearly the same frequency but do not correspond to the same vibrational mode, and are close enough to interact with each other. This results in an effect exactly analogous to the case of mechanically coupled oscillators, in which the two identical vibration frequencies are split into one slightly higher and one slightly lower than the original value. This shifts the position of the vibration in its potential curve, thus altering the nuclear turning points and in turn (in the authors' theory) the overlap between the ground and excited states. Fig. 1 shows how the triggering can be brought about by a comparatively small change in the ground state potential curve resulting in a large change in the amount of overlap between the wave functions of the ground and excited states. Overlap and transition probability are a maximum when the peaks of the wave functions representing the upper and lower states are in phase with each other. Curves (A) and (B) represent the normal function in the lower and upper states and are out of phase. On the right of the upper potential curve the perturbation brought about by the Fermi Resonance is dotted in. This results in a shift of the upper state vibrational wave function to the "in phase" position shown by the dotted curve (C). The perturbation might occur equally well in the lower state of the molecule. In the actual case of a polyatomic molecule, the vibrational coordinate is a point in a many-dimensional hyperspace. As is customary, this has been reduced to a two-dimensional picture for simplicity.

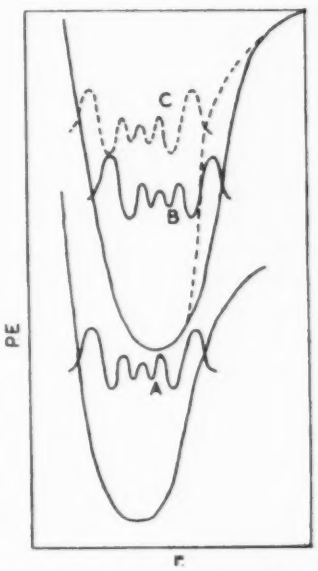


FIG. 1.—*The effect of Fermi Resonance in changing the overlap of vibrational wave functions*

Such an intermolecular Fermi Resonance would require rather intimate contact between the odorous molecule and the receptor. For molecules as polarizable as are most odorous substances, surface adsorption compounds would provide the required degree of intimacy, i.e., at least a few per cent of overlap between the wave functions of the two components.

It is instructive to consider what light this theory can throw on the question of the effect of air temperature and humidity, and also air movement, on the perception of odours.

The effect of temperature on odour perception has not been thoroughly studied experimentally, and much

of the published data is rendered obscure by a failure to discriminate between trigeminal and olfactory stimulation.[19, 20] Moreover, the effects of temperature and humidity cannot be wholly separated on account of the possibility of cooling by evaporation in the nasal passages. What information there is, however, indicates that the strength of the sensation is weakened when the humidity is high and the air temperature is close to that of the body. Thus Marimura[21] found that the nose was most sensitive to propionic and acetic acids, camphor, naphthalene and chloroform when the temperature was between 25° and 30°C., and that an increase of 5° in the temperature raised the threshold appreciably. Again, Kerka[22] reports a decline in the intensity of the odours of, for example, *iso*valeric acid, methyl salicylate, pyridine and cigarette smoke with increased temperature and humidity. At temperatures above 95°F. and at 55% relative humidity the odours were reduced to about threshold level at a concentration of odorous material which would be scored between "definite" and "strong" under cool, dry conditions. (At extremely low temperatures the sensitivity of the olfactory apparatus would, of course, be expected to decrease as a result of the slowing down of the whole metabolic process. The rise in sensitivity as one moves to warmer surroundings should not be confused with the effect which is under discussion here and which would be noticeable in the range 20° to 35°C.)

It is suggested that high temperature and himidity reduce the strength of the sensation by interposing an adsorbed film of water between the odorous molecule and the olfactory pigment in the cell membrane.

The effect of air movement is at first sight more puzzling. It requires only a very simple test to show that odours are perceived very much more readily when the air in the nasal passages is in motion. Air movement has, indeed, been listed as one of the necessary conditions for odour perception.[4, 5] Because of the specific adsorption required for the Fermi Resonance to be effective, it might be expected that the adsorbed molecules would remain on the end-organ and produce a more or less persistent sensation. This does not happen, and the authors believe that the odorous molecules are expelled rather violently from the surface by the very electronic process which they trigger in the cell membrane. If the expulsion removes the odorous molecules to a distance of several free paths from the surface, the air close to the surface will become rapidly denuded of odorous molecules by a process of preferential adsorption followed by violent ejection. Air movement would be required to bring the odorous molecules back to the surface, and if fresh, non-odorous air is inhaled it will instantly sweep away the odorous molecules so that the evanescence of the olfactory sensation is readily explained.

It will be observed that this theory assigns a central rôle to the olfactory pigment. In other words, it requires that the olfactory cell walls, and particularly the olfactory "hairs," shall contain pigment or other molecules having low vibrational frequencies associated with that part of the molecule which has a low-lying electronic level. The pigment must consist of several chemical species, probably of a single basic type but tuned to different vibrational frequencies by substituents of varying mass or position. It is interesting that the observed brown colour of the olfactory region is more consistent with absorption by an array of coloured molecules than the absorption by a single molecular species. The theory of Hainer, Emslie and Jacobson[3] suggests that there should be about 24 different pigment types characterizing and differentiating the 24 types of end-organ which they postulate.

Odorous molecules adsorbed on the pigment should show an altered low-frequency vibrational spectrum, and associated with this there should be a change in the colour of the pigment as a result of the changed electronic transition probability. The magnitude of these shifts cannot at present be estimated, but such observations would constitute one possible experimental test of the present theory. A thorough investigation of the constitution and properties of the olfactory pigment is long overdue.

It is unlikely that the required physical behaviour of the pigment can be provided by a molecule with a rigid, planar, conjugated system such as is present in a porphyrin for instance. On the contrary, a rather loosely bound, "flapping" type of structure is indicated. In *in vitro* systems, molecules such as terphenyl and the cyanine dyes provide typical energy-tapping structures. It may be significant that rates suffering from a severe vitamin *A* deficiency lost the ability to discriminate between eucalyptol and benzaldehyde.[23] The vitamin *A* type of molecule would satisfy admirably the requirement for a conjugated but loosely connected structure. In view of the close physical association of the organs of sight and smell, and their possible evolution from a common sensitive area, the authors' postulate of a somewhat similar mechanism of stimulation makes it likely that the olfactory pigments will turn out to be closely related to visual pigments of the rhodopsin type. The process of colour vision (located in the cones) has already been shown[24] to involve several pigments and has obvious parallels with the suggested mechanism of odour perception.

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DR. KURT KULKA*

The Preparation of Aromatic Aldehydes VI

Benzaldehydes from Acids and Acid Derivatives

1. Reduction with Sodium Amalgam

The reduction of a carboxylic acid to its corresponding aldehyde with sodium amalgam is largely of theoretical interest, but it will be described because it is one of the few processes by which a free acid—rather than an acid derivative—is converted to the aldehyde.

The preparation of salicylaldehyde from salicylic acid is an example of the reaction.[50]

"15 g. of salicyclic acid are neutralized with sodium carbonate solution and diluted with water to 1,000 cc. The solution is heated to about 90° C. and 18 g. of *p*-toluidine are dissolved. This amine will bind the aldehyde, as soon as it is formed, in a Schiff's base. The solution is permitted to come to room temperature, and 15 g. of boric acid and 250 g. of sodium chloride are added. To the agitated solution, 330-430 g. of 2% sodium amalgam are gradually added, and the reaction mixture is kept on the acid side by adding 120 g. of boric acid in portions. The reaction is completed when a sample on acidification does not yield salicylic acid. After acidification of the reaction mass, 7.5 g. of the aldehyde are obtained by steam distillation."

The process was improved by Weil and Ostermeier,[51] replaced some of the boric acid with hydrochloric acid, and used sodium bisulfite to bind the formed aldehyde.

2. Pyrolysis of Calcium Salts

The pyrolysis of calcium salts of organic acids in the presence of calcium formate is one of the oldest known ways of preparing aldehydes. The method was first applied in 1856 by Piria,[52] who used equimolar amounts of the reactants. The reaction proceeds according to:

$$(C_6H_5COO)_2Ca + (HCOO)_2Ca \longrightarrow 2\ C_6H_5CHO + Ca_2(CO_3)_2$$

The procedure consists in mixing the two acids thoroughly with the required amount of calcium hydroxide and distilling off the aldehyde as it is formed. Today, Piria's method has little more than historical interest. With aromatic acids the yields are too low to be commercially feasible, and aliphatic aldehydes are prepared more conveniently by other methods. However, the method laid the foundation for a more recent and valuable reaction:

Vapor Phase Reduction with Formic Acid

The catalytic conversion of organic acids with formic acid in the vapor phase proceeds as follows:

$$ArCOOH + HCOOH \xrightarrow{\text{catalyst}} ArCHO + CO_2 + H_2O$$

Catalysts: Among the catalysts used are manganese oxide,[53] cadminum oxide,[54] calcium oxide, aluminum oxide, zinc oxide, thorium oxide, etc. Titanium dioxide was used by Davies and Hodgson,[55] who obtained yields up to 92% from substituted benzoic acids. In a more recent patent[56] the addition of a reducing gas to the carboxylic acid-formic acid gas mixture is suggested, and a ketonizing catalyst such as manganous oxide (MnO) is used.

In the course of the reaction, the carboxylic acid probably reacts with the catalyst to form a salt, which is immediately decomposed to the carbonyl compound.

Reaction Temperature: The reaction is carried out at elevated temperatures, ranging from 250-400° C.

Amount of Formic Acid: An equimolar amount of formic acid is sufficient in the case of the lower aliphatic acids, whereas with higher molecular aliphatic and aromatic acids an excess of formic acid will be advisable.

Example

An example of this widely applicable reaction is the preparation of "Cyclamal" from *p*-isopropyl-α-methyl-hydrocinnamic acid:[57]

A tube of high value resistance glass, 1 m. long and 50 mm. in diameter, is filled with the catalyst (manganous oxide), on a base of granulated pumice. The vapor mixture of 600 g. of formic acid and 400 g. of *p*-isopropyl-α-methyl-hydrocinnamic acid, is passed through this tube in the course of 1 hr. at a temperature of 360° C. The reaction mixture is fractionated, yielding 80% of the aldehyde, b.p. 118-119° C. at 6 mm. A small amount of unreacted acid is recovered.

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An interesting variation of this reaction is appllied by Mention and Valet:[79]

A mixture of formic acid and the acid corresponding to the desired aldehyde is passed into a dispersion of the metallic oxide catalyst in a liquid which is inert at high temperatures; for example, Pennsylvania mineral oil. Then an equimolar mixture of 90% formic acid and a lower aliphatic acid is vigorously agitated and passed at 320-330° C. into the bottom of the reaction vessel which holds the dispersion of mineral oil and, for example, manganese dioxide.

3. Decarboxylation of Benzoylformic Acids

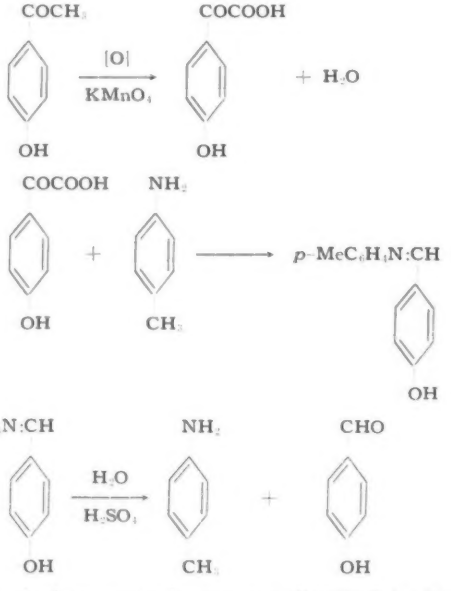
Decarboxylation of benzoylformic acids can go in two directions:

1) $ArCOCOOH \longrightarrow ArCOOH + CO$

2) $ArCOCOOH \longrightarrow ArCHO + CO_2$

Reaction 2 is favored if the carbonyl group is protected; in this case the benzoylformic acids are reacted with aniline, N,N-dimethyl-*p*-toluidine or diphenylamine, and the reaction product heated, resulting in the formation of carbon dioxide and a Schiff's base: $ArCH{:}NC_6H_5$ (de Thann and Mulhouse[80]). On acid hydrolysis of the latter the aldehyde and aniline are obtained. In another procedure, the carbonyl group is protected by the reaction with sodium bisulfite before proceeding with the decarboxylation of the carboxyl group (Gardner and Naylor, Jr.[81]). According to de Thann and Mullhouse, for example, *p*-methoxy-phenylglyoxylic acid (*p*-$CH_3OC_6H_4COCOOH$) is refluxed for 3 hr. with 3 parts of aniline. The unreacted excess aniline is distilled off in vacuum (strong carbon dioxide evolution) and the residue (Schiff's base) is hydrolyzed with 10 times its weight of 20 or 25% sulfuric acid. Steam distillation yields *p*-methoxybenzaldehyde and aniline.

Businelli[82] prepared *p*-hydroxybenzaldehyde according to:



10 g. of *p*-hydroxyacetophenone are dissolved in 100 cc. of 5% aqueous sodium hydroxide solution, and 800 cc. of water are added. Over a period of 6 hr., 46.5 g. of potassium permanganate are added to this solution, at a temperature of 30° C. After 15 hr. the reaction mass is filtered, and the aqueous part is acidified and extracted with ether. The resulting *p*-hydroxybenzoyl-formic acid can be purified by washing with chloroform or over the sodium bisulfite addition compound.

50 g. of *p*-hydroxybenzoylformic acid and 250 g. of *p*-toluidine are heated for 40 min. to 85-90° C. Then the temperature is raised to 130° C. After cooling, 500 cc. of benzene are added, and the solution is filtered. Hydrolysis with 5% sulfuric acid and extraction yield the aldehyde in a 79.5% yield.

Gardner and Naylor, Jr. applied sodium bisulfite in the preparation of phthaldehydic acid according to:

and obtained a 40-41% theoretical yield.

Potassium permanganate is specific for the oxidation of acetophenones to benzoylformic acids. (Oxidation with nitrobenzene under alkaline conditions gave negative results[82].)

Bouveault[83] reacted benzene and substituted benzenes, such as toluene and anisole, with ethyloxalate acid chloride in a Friedel-Craft type reaction, using aluminum chloride. In this way the esters of benzoylformic acid, occupying the *para* position, are obtained in satisfactory yields. On decarboxylation, as described above, the aromatic aldehydes are obtained.

Mauthner[84] converted an acid-chloride to the acid cyanide, which on hydrolysis yielded the benzoylformic acid. Decarboxylation with the aid of aniline resulted in the aromatic aldehyde.

The preparation of polycyclic aryl aldehydes, such as 2-naphthaldehyde, pyrene-3-aldehyde, phenanthrene-2-aldehyde, etc., was recently reported by Cymerman-Craig, Loder and Moore.[85] The arylglyoxylic acids were readily obtained by permanganate oxidation of the solid arylmethyl ketones in pyridine solution. Decarboxylation of the acid proceeded best with N:N-dimethyl-*p*-toluidine at a temperature approaching the melting point of the glyoxylic acid.

Example

The preparation of 2-naphthaldehyde is an example of the process.

4.52 g. of 2-acetylnaphthalene in 200 cc. of pyridine were mixed with 2.5 g. of potassium hydroxide in 100 cc. of water. Then the solution was treated over a 2 hr. period at a temperature of 10-15° C. with 13 g. of potassium permanganate dissolved in 500 cc. of water. After an additional ½ hr. reaction, the excess permanganate was destroyed with sodium sulfite. The manganese dioxide was filtered off and washed with hot water. The filtrate was acidified and a precipitate formed which was identified as 2-naphthoic acid (1.42 g.). The liquid filtrate was extracted with ether and yielded 2.72 g. (51% yield) of 2-naphthylglyoxylic acid. 2 g. of 2-naphthylglyoxylic acid were treated with 2 cc. of N: N-dimethyl-*p*-toluidine at 120° and gave 1.34 g. of 2-naphthaldehyde (86% yield).

4. Condensation of Sodium Glyoxylate with a Monoalkyl Ether of Pyrocatechol

The sodium salt of glyoxylic acid reacts with a monoalkyl ether of pyrocatechol under alkaline conditions to give the salt of the hydroxyphenylglyoxylic acid. On treatment with a mild oxidizing agent such as a reducible compound of a heavy metal, or aromatic nitrobodies, the corresponding keto acid is obtained. Decarboxylation yields the aldehyde.

The method is of particular interest because it is easily applicable to the preparation of higher homologues of

vanillin, such as ethyl vanillin.

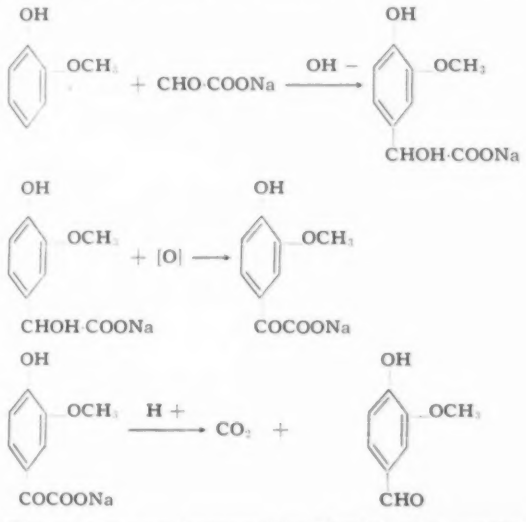
Example

The preparation of vanillin[97] is an example of the process:

"15 g. of glyoxylic acid are neutralized with an aqueous sodium hydroxide solution, and 10 g. of guaiacol dissolved in the calculated amount of a concentrated sodium hydroxide solution is added. After prolonged standing at room temperature, the reaction mixture is acidified with acetic acid and steam distilled. Approximately 3.2 g. of unreacted guaiacol are recovered. The residue is made slightly alkaline, then 70 cc. of a 15% sodium hydroxide solution and 25 g. of powdered copper sulfate are added. The reaction mass is heated under agitation to 90-100° C. for several hours. Then the copper sludge is filtered off, the liquid part acidified, and the vanillin extracted with benzene, yielding 8 g. of crude product."

Following this procedure, Chelintzev and Rodnevich[97] obtained an 80% yield of vanillin.

A similar method of preparing vanillin was described by Boedeker and Volk,[98] as follows:



The process was improved by Kamlet[99] who reacted 1 mole of the alkali metal salt of glyoxylic acid with 1.1 to 1.5 moles of guaiacol or a substituted guaiacol. After a reaction time of 24-48 hours at room temperature, the excess guaiacol was recovered. By heating 1 mole of the resulting *m*-alkoxy-*p*-hydroxyphenylglycolate with 6 moles of cupric hydroxide, oxidation and decarboxylation occur, resulting in the alkali metal salt of vanillin. After addition of hydrobromic acid or hydrochloric acid the formed cuprous oxide is removed as hydrocupous halide in aqueous solution, preventing troublesome filtration problems.

5. The Rosenmund Reaction

This reaction consists in the catalytic reduction of an acid halide to the aldehyde, thus:

$$ArCOCl \xrightarrow[\text{catalyst}]{H_2} ArCHO + HCl$$

It is usually conducted in the presence of a small amount of a "mild" catalyst poison to prevent acid formation. The reaction, which is applicable to aromatic as well as aliphatic acid halides, was first described by Rosenmund.[100] The yields in the Rosenmund reaction range from 70% to almost theoretical amounts; the reaction is, therefore, in many cases an attractive process.

Some of the important factors to be considered in the Rosenmund reaction are:

1) Purity of the Acid Halide

This reactant must be free from sulfur- or phosphorous-containing by-products which might have been formed in the preparation of the acid halide. Such contaminants can prevent the reaction from taking place by an uncontrolled poisoning of the catalyst.

2) Nature of the Catalyst

The commonly used catalyst is palladium on barium sulfate ($Pd.BaSO_4$). The palladium content of this catalyst is usually 5%, but in some cases catalysts having a lower amount of palladium are used. For 8-10 parts of the acid halide brought into the reaction, generally 1 part of the catalyst is used.

According to Schmid,[101] the catalyst is prepared as follows:

20 parts of barium sulfate (hot precipitated) are dispersed in 400 parts of hot water. To this dispersion are added: 1.7 parts of palladium chloride, 1 part of formaldehyde 40%, and 50 parts of water. The mixture is agitated and made alkaline with sodium hydroxide. It is then boiled. The catalyst precipitates and is separated from the clear aqueous part and washed neutral with water. After drying in vacuum the catalyst is pulverized and kept in a firmly closed bottle.

3) Nature of the Catalyst Poison

A small amount of a quinoline sulfur compound is the mild catalyst poison, usually applied to prevent the reaction from going beyond the aldehyde stage. It is prepared as follows:

1 g. of sulfur is refluxed with 6 g. of quinoline for 5 hr. The resulting liquid is diluated to 70 cc. with purified xylene.[102]

Weygand and Meusel[103] used thiourea as the partial catalyst inhibitor and obtained almost quantitative yields of benzaldehyde.

4) Application of a Solvent

The solvents generally applied are: benzene, toluene, tetralin or xylene. It is advisable to apply purified solvents in order to avoid inactivation of the catalyst. The amount of solvent used is approximately 3-4 times the amount of the acid halide. The choice of the solvent depends largely on its boiling point. For best results the reaction temperature should be kept at the lowest temperature at which hydrochloric acid gas will be given off.

If a solvent is omitted the yield will be considerably lower.

5) Reaction Temperature

The reaction is carried out at the reflux temperature of the solvent. A stream of hydrogen is bubbled through the well agitated reaction mixture. The evolved hydrochloric acid is led into a standardized sodium hydroxide or potassium hydroxide solution to observe the progress and the completion of the reaction.

Examples

The following two examples were described by Rosenmund in his original paper:

Hydrogen is bubbled through an agitated, refluxing mixture of 5 g. of benzoyl chloride in 25 cc. of xylene and 5 g. of palladium-barium-sulfate catalyst. Yield of benzaldehyde: 97%.

Using a similar technique, from 4 g. of *p*-carbomethoxy-hydroxybenzoyl chloride in 25 cc. of cumol (which was used as the solvent) and 2 g. of palladium-barium-sulfate catalyst, a 95% yield of the corresponding aldehyde was obtained.

Hershberg and Cason[104] describe the preparation of β-naphthaldehyde as follows:

57 g. (0.3 mole) of β-naphthoyl chloride 200 cc. of xylene (purified by distillation over sodium), 6 g. of palladium-barium-sulfate catalyst, and 0.6 g. of quinoline sulfur catalyst poison are placed in a 500 cc., 3-necked flask equipped with a mechanical mercury sealed stirrer, and a reflux condenser. This condenser is connected by a rubber tube to a 6 mm. glass tube extending to the bottom of a 500 cc. Erlenmeyer flask containing 400 cc. of distilled water and some phenolphthalein indicator solution. A buret containing a 5 N sodium hydroxide solution is attached to the Erlenmeyer flask. Hydrogen is fed into the well agitated reaction mixture, which is kept at a temperature of 140-150° C. As the reaction proceeds, hydrochloric acid gas is evolved into the Erlenmeyer flask. By adding the sodium hydroxide solution to the Erlenmeyer flask, the progress of the reaction can be followed. The yield amounts to 74-81%.

An example of the Rosenmund reaction using palladium-barium-sulfate catalyst without a catalyst poison is described by Barnes[105] in the preparation of 2, 4, 6-trimethylbenzaldehyde from mesitoyl chloride whereby a 70-80% yield is obtained. The reaction conditions are almost identical with those in the more general method using a partially poisoned catalyst.

A review discussion of the Rosenmund reaction by Mosettig and Mozingo[106] appeared in "Organic Reactions."

6. The Sonn and Müller Synthesis

This process consists in the formation of an aldehyde from an anilide or amide, which on dehydration with thionyl chloride or phosphorous pentachloride gives the imido chloride. This compound is reduced with anhydrous stannous chloride to the imine, which on hydrolysis yields the aldehyde.

$$C_6H_5CONH_2 + SOCl_2 \longrightarrow C_6H_5\overset{Cl}{\overset{|}{C}}{:}NH + SO_2 + HCl$$

$$C_6H_5\overset{Cl}{\overset{|}{C}}{:}NH + 3\,HCl + SnCl_2 \longrightarrow C_6H_5CH{:}NH{\cdot}HCl + SnCl_4$$

$$C_6H_5CH{:}NH{\cdot}HCl + H_2O \longrightarrow C_6H_5CHO + NH_4{\cdot}Cl$$

The reaction will be advantageous

1) where the Rosenmund reaction cannot be applied, for example where the acid contains an easily reducible group;

2) if the anilide or amide is more readily available than the respective acid.

The yields in the Sonn and Müller synthesis are usually comparable with those obtained by the Rosenmund reaction.

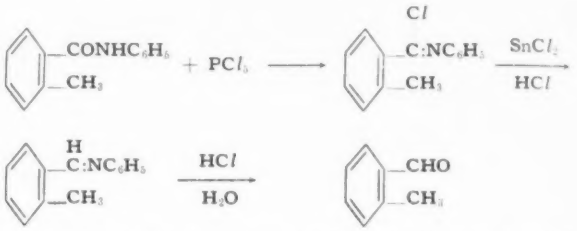
Sonn and Müller in their original paper[107] reported the preparation of various aromatic aldehydes, such as benzaldehyde and *p*-hydroxybenzaldehyde from the respective acids, which were converted via their acid chlorides to the anilides.

Example

The preparation of benzaldehyde is described as follows:

"70 g. of dried and finely powdered stannous chloride are covered with 300 cc. dry ether. Dry hydrochloric acid gas is introduced until the salt is dissolved. A solution of 25 g. of freshly distilled benzanilide-imidochloride and 200 cc. of dry ether are added. Separation into two layers will occur and the lower part will crystallize. After separation and washing of the crystals with ether a yield of 46 g. results. The crystals are treated with 58 cc. of dilute hydrochloric acid, and steam distilled to yield 12.7 g. of benzaldehyde."

An interesting application of the Sonn and Müller synthesis was used by Williams, Witten and Krynitsky[108] in the preparation of *o*-tolualdehyde:



"*o*-Toluanilide is prepared by the reaction of *o*-tolylmagnesium bromide with phenyl isocyanate. 30 g. (0.14 mole) of *o*-toluanilide, and 20 cc. of dry benzene are heated to 50° C. and 30 g. (0.14 mole) of phosphorous pentachloride are added over a period of 10 min. Then the bath temperature is kept at 75° C. for 10 min. The benzene and most of the phosphorous-oxy-trichloride are removed by distillation at a vacuum of 20 mm. from a water bath heated to 95° C. The crude N-phenyl-*o*-toluimidylchloride remains as the residue.

At the same time an agitated mixture of 50 g. of anhydrous stannous chloride and 225 cc. of dry ether is saturated with dry hydrochloric acid gas. Within 3 hr. the stannous chloride will dissolve, forming a lower, clear, viscous layer. The hydrochloric acid addition is stopped, and the above imidylchloride, diluted with 25 cc. of ether, is added under agitation. The reaction is exothermic, and cooling is necessary. After 1 hour's reaction under agitation, the reaction mixture is allowed to stand for 12 hr. at room temperature. Then 100 cc. of water and 100 g. of cracked ice are added, and the ether is recovered by distillation and steam passed through the residue until the distillate becomes clear. The aldehyde is recovered from the distillate by extraction with ether. The yield amounts to 62-70% (10.5-12 g. boiling at 90-93° C. at 19 mm.)."

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Dr. Noemi G. Martinez Nadal at work with her assistant

DR. NOEMÍ GARCÍA DE MARTÍNEZ NADAL*

Separation and Identification of Terpenic Compounds in Puerto Rican Bay Oil, *Myrcia Acris*

Using Chromatographic Methods

Chromatographic separation not only affords a new efficient method of producing "Terpeneless Bay Oil" (1), but also serves as a method of separating and identifying the chemical constituents of this oil.

Complete studies on the chemical composition and physico-chemical properties of Puerto Rican bay oil, have previously been done by the author of this publication. The above work was based on analysis, by separation of constituents using fractional distillation and identification of fractions by Raman effect (confirmed by derivatives) (2).

In our present work, separation was brought about by chromatographic adsorption.

Experimental Results and Discussion

I—Isolation of "Terpenic Fraction" of Bay Oil.

In order to make comparisons of chromatographic separation of individual terpenes, bay oil was separated into its two main fractions, i.e., "Terpenic" and "Non-Terpenic." Three methods of separation were used with the idea of comparing and evaluating them.

a) Separation was effected by chromatographic methods (1)

b) Since the so-called "Non-Terpenic" fraction of Bay Oil consists chiefly of phenols, separation was brought about by using the classical method of estimating phenols in essential oils (3) which is based on the fact that phenols react with the alkali hydroxides, and give rise to water soluble phenolates.

c) Separation of terpenic fractions was effected by fractional distillation carried out at a reduced pressure.

II—Study of "Terpenic Fraction" of Bay Oil

Once the complete oil was separated into its two main portions by the above methods, a complete study of the "Terpenic" fraction was carried out.

a) By chromatographic separation we obtained a light fraction consisting chiefly of terpenes, but contaminated with some cineole 1-8. Presence of the latter was spotted both by chemical and organoleptic tests. The main terpenic fraction, consisted of 5 sub-fractions which are described in Table 1. Derivatives for confirmation were made of the different fractions once a terpene was suspected from its physico-chemical properties. Tetrabromides were prepared according to Wallach (4) "One volume of terpene is diluted with 4 volumes of ether and cooled in an ice bath; 0.7 volume of bromine are added dropwise to the mixture, at low temperature. After all the bromine has been added, the ether is evaporated. The mixture is allowed to stand until crystals begin to

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*Formerly Noemi G. Arriillaga, chemist specialist in perfumes, U. S. Experiment Station. At present Researchist and Assistant Professor of Chemistry, College of Agriculture and Mechanical Arts, Mayaguez, Puerto Rico, where this research was carried out. Previous work was done by J. C. Kirchner and John M. Miller on the chromatographic separation of terpenes which was reported in an article "Preparation of Terpeneless Essential Oils," published in Industrial and Engineering Chemistry, Vol. 44 page 318, February 1952. This paper adds to the data obtained by Kirchner and Miller and also that obtained by Dr. Nadal on the separation of terpenes by chromatography.

TABLE 1.

CHROMATOGRAPHIC STUDY OF THE TERPENIC PORTION OF BAY OIL

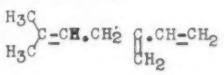
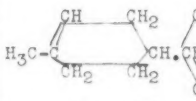
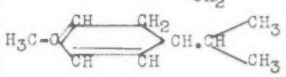
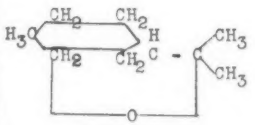
Fraction #	Index of ref. n/25	Flourescine Bromine	Conc. H_2SO_4	Schorn's Reagent (cineole 1-8)	Schiff's Reagent Aldehyde	Adduct Maleic anhydride	Tetra-bromide	Name	Formula
1	1.4570	✓	✓Yellow	-	-	169°C	-	✓-pinene	
2	1.4678	✓	✓Brown	-	-	35°C	131°C	myrcene	
3	"	✓	✓Dark Brown	✓	-				
4	"	✓	"	✓	-				
5	"	✓	"	✓	-				

TABLE 2.

CHROMATOGRAPHIC SEPARATION OF CINEOLE FROM TERPENIC FRACTIONS IN BAY OIL

Fraction #	Physical Properties		Derivatives		Compound Present	
	Index of Ref. n/25	Density 25/25	Adduct Maleic anhydride m.p.	Cineole Resorcinol m.p.	Name	Formula
1	1.468	.8105	124.0°C	-	Dipentene	
2	1.470	.8346	103°C	-	d-ℓ Phellandrene	
3	1.476	.8346	127°C	-	d-Phellandrene	
4	1.457	.9280	-	89°C	1,8 Cineole	
5	1.460	.9280	-	89°C	1,8 Cineole	

separate. Crystals are washed with alcohol and recrystallised from ether."

Adducts were prepared with maleic anhydride by the "Diene Synthesis" (5).

10 gms. of the terpene are refluxed with 5 gms. of fresbly sublimed maleic anhydride in 20 cc of ether for 30 min. The adduct is recrystallised from a suitable solvent.

From Table 1—we arrived at the conclusions that the first two fractions were pure terpenes, the first one, α-pinene indicated by its adduct, m.p. 169°C. The second fraction indicated to be myrcene, terpene which easily polymerizes and renders the oil insoluble.

Fractions 3, 4, 5, showed the presence of terpenes as well as cineole and therefore they were passed through a chromatographic column to separate cineole and other terpenes.

Separation of Cineole, $C_{10}H_{18}O$, dipentene, $C_{10}H_{16}$, and α-phellandrene $C_{10}H_{16}$

Terpenic fractions 3,4,5 which showed the presence of cineole were united and passed through a chromatographic column, 400 mm., packed with 172 gms. of alumina and moisten with 170 ml. of petroleum ether (b.p. 60-80°C). The total oil was poured on the column and the chromatogram was developed with 200 ml. of light petroleum ether (b.p. 30°C). The solvent in the fractions was evaporated and the residues were studied. Derivatives were made of the different fractions for confirmation of the presence of compounds. Table 2—gives a description of the fractions.

From Table 2—we can see, that fraction 1 consisted of the terpenic hydrocarbon dipentene. The maleic anhydride adduct, m. p. 124°C confirmed its presence. Fraction 2 confirmed the presence of α and b-phellandrene in Bay Oil from Puerto Rico. Its presence was suspected by other work, but it had not been confirmed (2) A maleic anhydride adduct was prepared from this fraction according to Birch (6) and relative amounts of the d- and l- isomers were determined. The m.p. of the adduct 103°C indicated 40% d- and 60%l- isomers. Fraction 3, consisted of almost pure phellandrene, giving an adduct of the d-α-compound,

TABLE 3.

CHROMATOGRAPHIC SEPARATION OF CONSTITUENTS IN "TERPENIC FRACTION" OF BAY OIL SEPARATED BY KOH REMOVAL OF PHENOLS

Fraction #	Ref. index n/25	Compound Present
1	1.465	terpenic
2	1.472	terpenic
3	1.450	cineole ≠ terpenes
4	1.492	terpenes
5	1.509	phenols ≠ terpenes
6	1.518	phenols ≠ terpenes
7	1.524	phenols ≠ terpenes
8	1.525	phenols ≠ terpenes
9	1.530	phenols

TABLE 4.

DESCRIPTION AND PHYSICAL CONSTANTS OF FRACTIONS OF BAY OIL OBTAINED FROM VACUUM DISTILLATION

Fraction #	Maximum Temp. °C	Yield gms.	Physical Constants		Tests		
			Ref. index n/25	d/25	Cineole	Citral	Phenol
1	45	38	1.471	.8449	≠	-	-
2	45	30	1.471	.8504	≠ ≠	-	-
3	60	32	1.477	.8778	≠ ≠	-	-
4	80	30	1.467	.8775	≠	-	-
5	90	30	1.489	.9573	≠	≠	≠
6	125	32	1.525	1.035	-	≠	≠
7	158	35	1.538	1.052	-	-	≠
8	165	40	1.544	1.062	-	-	≠
9	170	36	1.538	1.072	-	-	≠

m.p. 127°C. Fraction 4 and 5 consisted solely of cineole 1,8, which was identified and separated by treating the fraction with ferrocyanidric acid to give a crystalline complex. The latter was washed with light petroleum ether dissolved in 10% NaOH and distilled by steam distillation. Cineole, in the free state, was extracted with petroleum ether. Cineole was confirmed by the cineole—resorcinol solvate compound, $C_{10}H_{18}O.C_6H_6O_2$, m.p. 89°C.

b) Study of the "Terpenic Fraction" separated from Bay Oil by phenolic removal with KOH

This main fraction showed the evidence of contamination also with cineole 1,8 as well as incomplete removal of phenols. The whole fraction was passed through a chromatographic column to separate constituents and to compare with the separation brought about only by chromatographic methods. The same procedure was used as that described for separation of the whole oil. (1) Silicic acid was used as adsorbent, and heavy and light petroleum ether were used as solvent and eluant. Last fractions were collected with acetone. Table 3—gives a description of the fractions, based on a series of tests.

Tests and derivatives confirmed the presence of α-pinene, myrcene, dipentene, cineole and phenolic constituents up to 7 per cent of the sample.

c) Study of the "Terpenic Fraction" of Bay Oil from P. R. separated by fractional distillation carried out at reduced pressure.

9 main fractions were obtained by fractional distillation of 435 gms of Bay Oil dried previously with anhydrous Na_2SO_4 and fractionated at reduced pressure (20 mm.) Table 4—gives a description of these main fractions.

From Table 4, we can see that the first four fractions were terpenic in nature. Traces of cineole, citral and phenolic constituents were spotted throughout the fractions.

To make a complete study of this "terpenic portion" 25cc of these four fractions were chromatographed through an alumina column using heavy and light petroleum ether as solvent and eluant.

Fraction I was resolved into 4 fractions, namely Ia, Ib, Ic, Id by this procedure. Table 5, which follows gives a description of the fractions.

Fraction Ia, which was very small consisted of α-pinene, identified by its adduct, m.p. 169°C. Fraction Ib which consisted the bulk of the main fraction was mostly myrcene, identified by its tetrabromide, m.p. 131°C. Fraction Ic and Id consisted solely of cineole, identified by its resorcinol addition compound, m.p. 89°C.

Fraction II was equally resolved into 4 fractions, namely IIa, IIb, IIc, and IId, Table 6 which follows gives a description of the fractions.

The larger fraction IIa consisted of dipentene, identified by its maleic anhydride adduct, m.p. 124°C. Fraction IIb consisted of d-α-phellandrene, identified by its maleic anhydride adduct, m.p. 127°C and checked by its nitrosite derivative. The last two fractions IIc and IId were very small and showed the presence of cineole.

Fraction III was resolved into 5 fractions, namely IIIa, IIIb, IIIc, IIId, IIIe. Fraction IIIb which was the largest consisted almost completely of dipentene, which was identified by its tetrabromide, m.p. 125°C. Traces of citral, cineole and phenols were spotted throughout the other fractions. Results are tabulated in Table 7.

Fraction IV was resolved into 4 fractions, namely IVa, IVb, IVc, IVd.

Table 8, which follows gives a description of the fractions. Fraction IVb, which was the largest fraction consisted of citral, identified by its semicarbazide, m.p. 165°C. Traces of cineole, terpenes, and phenols were spotted throughout the other fractions.

CONCLUSIONS

Analysis of Bay Oil was efficiently done by bringing separation of constituents by chromatographic adsorption.

Separation of dipentene, α-phellandrene and cineole 1,8 was made possible.

Removal of phenolic portion from Bay Oil by adsorption with KOH is not an efficient, complete separation.

Separation of α-pinene, myrcene and cineole was brought about by chromatographic adsorption.

Through different terpene separations, relationships were noted between the adsorptivity of the terpenes, their boiling point, structure of their molecule and numbers of double bonds present. A summary of these observations follows and are tabulated in Table 9.

(1) As expected adsorptivity decreases with decrease in boiling point.

(2) Bicyclic hydrocarbons which possess a more

TABLE 5.

DESCRIPTION OF CHROMATOGRAPHIC SEPARATIONS OF THE FIRST FRACTION OBTAINED IN THE FRACTIONAL DISTILLATION OF BAY OIL

Fraction I	Physical Constants			Derivatives		Main Constituent
	Index of Ref. n/25	d/25	Tetra-bromide m.p.	Adduct Maleic anhydride m.p.	Cineole Resorcinol m.p.	
a	1.467	.8360	-	169°C	-	α - pinene
b	1.468	.8563	131°C	-	-	myrcene
c	1.459	.9105	-	-	89°C	cineole
d	1.457	.9100	-	-	89°C	cineole

TABLE 6.

DESCRIPTION OF CHROMATOGRAPHIC SEPARATIONS OF THE SECOND FRACTION OBTAINED IN THE FRACTIONAL DISTILLATION OF BAY OIL

Fraction II	Physical Constants		Derivatives	Main Constituent
	Index of Ref. n/25	d/25	Adduct Maleic anhydride m.p.	
a	1.475	.8261	124°C	dipentene
b	1.477	.8310	127°C	d- phellandrene
c	1.4503	-	-	cineole (traces)
d	1.4570	.9102	-	cineole (traces)

TABLE 7.

DESCRIPTION OF CHROMATOGRAPHIC SEPARATION OF THE THIRD FRACTION

OBTAINED BY FRACTIONAL DISTILLATION OF BAY OIL

Fraction III	Physical Constants		Tests				Main Constituent
	Index of Ref. n/25	d/25	Tetra-bromide m.p.	Schorn's Reagent cineole	Schiff's Reagent aldehyde	Ferric-chloride phenols	
a	1.478	.8321	-	-	-	-	dipentene
b	1.472	.8062	125°C	-	-	-	dipentene
c	1.502	.8832	-	✓	✓	-	citral ✓ cineole (traces)
d	1.507	.8839	-	✓	✓	-	cineole ✓ citral (traces)
e	1.508	.9484	-	✓	-	✓	cineole ✓ phenols (traces)

TABLE 8.

DESCRIPTION OF CHROMATOGRAPHIC SEPARATION OF THE FOURTH FRACTION

OBTAINED BY FRACTIONAL DISTILLATION OF BAY OIL

Fraction IV	Physical Constants		Tests & Derivatives				Main Constituent
	Index of ref. n/25	d/25	Semicarbazide citral m.p.	Schorn Reagent cineole	Schiff Reagent citral	$FeCl_3$	
a	1.488	.8586	-	-		-	Terpenic
b	1.489	.8450	165°C		✓	-	citral
c	1.492	-	-	✓	✓	-	cineole ✓ citral
d	1.507	1.250	-			✓	phenols

TABLE 9.

RELATIONSHIP OF ADSORPTIVITY OF DIFFERENT TERPENES TO BOILING

POINT, STRUCTURE OF MOLECULE AND NUMBER OF DOUBLE BONDS

Name of Terpene	Boiling Point °C	Structure of Molecule	# of double bonds	Adsorptivity
α-pinene	154.75	dicyclic	1	✓
myrcene	171.50	open chain	3	✓ ✓ ✓
α-phellandrene	175.79	monocyclic	2	✓ ✓
dipentene	177.60	"	2	✓ ✓

compact molecule are less actively adsorbed than monocyclic and acyclic.

(3) Adsorptivity increases with increase in the number of double bonds in the molecule.

(4) Mixtures consisting of terpenes belonging to different groups are more readily separated.

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(3) Gildemeister and Hoffmann, "Die atherischen Ole," 3rd. ed. Vol. 1, 753.
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ACKNOWLEDGEMENT

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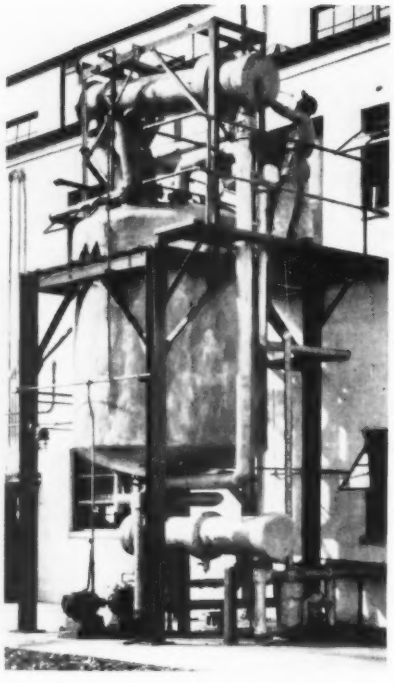


This outside reactor has an operating capacity of 2000 gals. Constructed of stainless steel to withstand the attack of acids and other chemicals under conditions of heat and high pressure, it is part of large-volume equipment at Van Ameringen-Haebler's Union Beach, N. J. plant.

Stainless Steel in Aromatics Production

RICHARD E. PARET*

The use of stainless steel for quality control in aromatics production equipment is based on the nature of the fragrance business itself.

High temperature reactors, continuous operation distillation runs, high frequency mechanical agitation demand a material with high corrosion resistance, ability to withstand temperature extremes, resistance to wear and abrasion, structural strength, ease of cleaning.

Processing equipment must not contaminate the products handled. Equipment must be capable of continuous operation without corroding, scaling, and be virtually impervious to oxidizing acids, or the high levels of quality achieved in the laboratory can never be maintained at production level.

The Role of Stainless Steel

Stainless steel is not a panacea that will answer all material requirements in the aromatics field; organic and non-metallic inorganic substances play important roles here too. But many processes would be virtually impossible, certainly impractical without stainless in vital places.

In its rightful place, stainless does a better job and costs less to buy, fabricate, use and maintain throughout its service life than any other commercial material.

How It Helps to Achieve Product Purity

Producers of aromatic chemicals like van Ameringen-Haebler Inc. for instance, use stainless steel to achieve standards of purity needed by their customers. Soap manufacturers, perfume companies, others—all must meet both statutory and marketing requirements which the use of stainless steel helps to make possible.

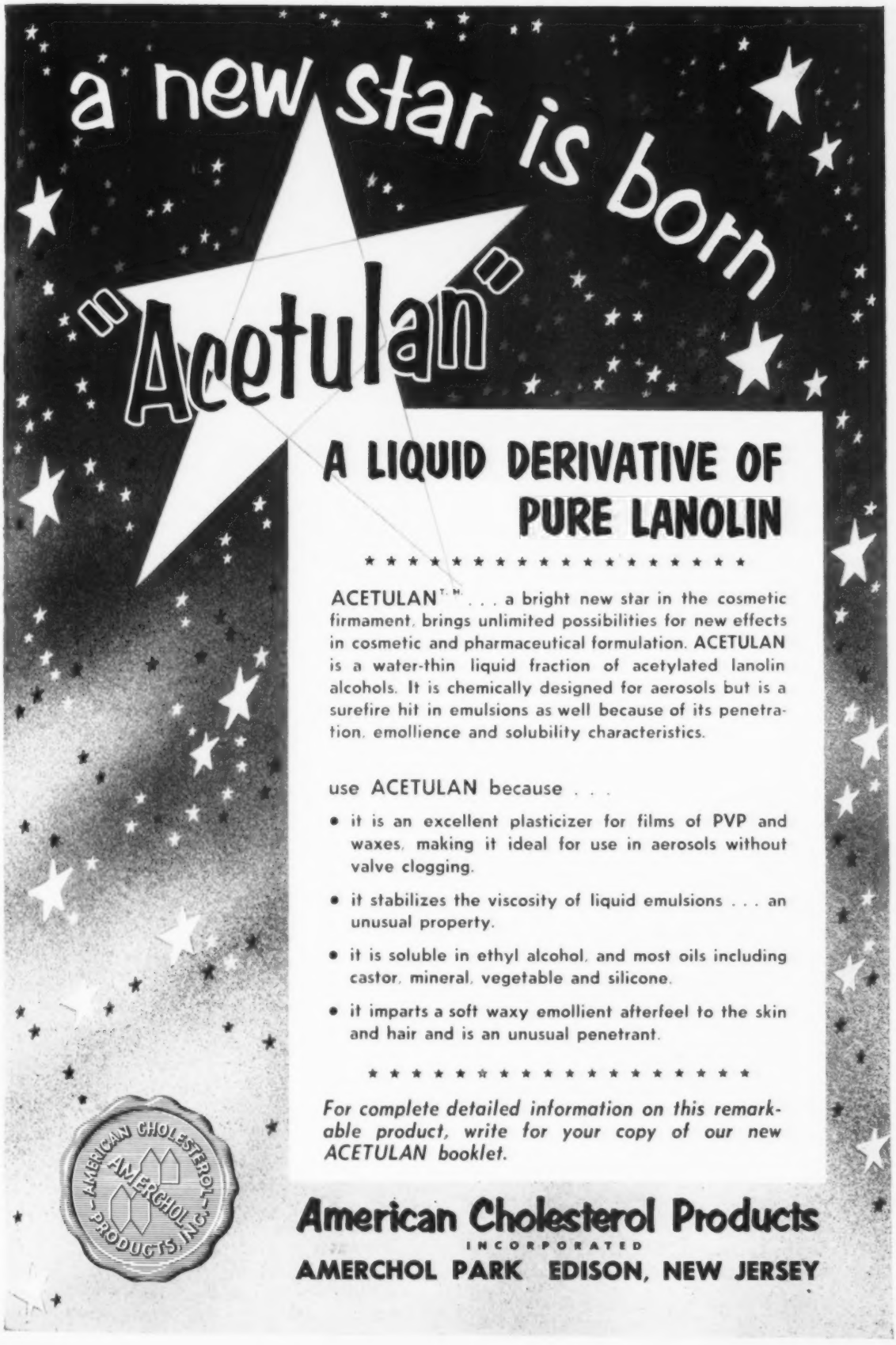
Many chemical processes cannot tolerate pickup of metallic ions or deterioration residue in the product. This is evident in the great sensitivity of aromatic chemicals to contaminants. Stainless prevents rust from entering process materials. Even in extreme cases where ions from stainless becomes a matter for concern, the metal excels all others in ability to stay out of the process.

Excellent cleanability is another stainless steel property. The most rigorous cleaning problem—decontamination of radioactive matter—is met with greatest success by stainless above all other metals.

Stainless combines great strength (50% stronger than ordinary steel) with high corrosion resistance; and a little goes a long way. Chromium-nickel austenitic grades work-harden. This means that erosive and

To guarantee against contamination of costly products, Van Ameringen-Haebler stores aromatic essences and other products in large stainless steel tanks such as these. Phenol ethyl alcohol, Van Ameringen-Haebler's mass production staple, is kept in these containers until shipment is made in stainless steel drums to soap manufacturers, and cosmetic producers, as well as its own New York City installation.

*Stainless steel specialist, Committee of Stainless Steel Producers, American Iron and Steel Institute.



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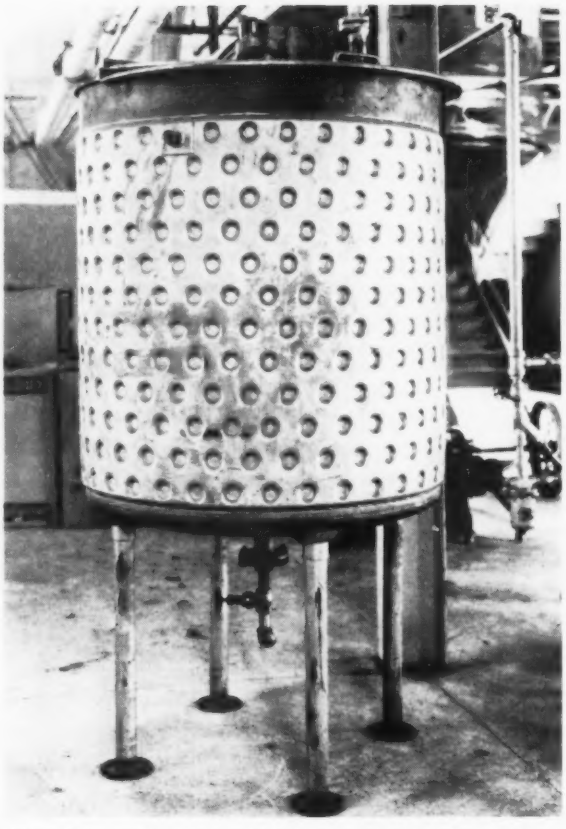

This stainless steel settling tank facilitates rapid scheduling at the reaction stage of Van Ameringen-Haebler's perfume production setup. When time-consuming separation processes are called for, compounds are shifted from much needed reactors to these vessels. The interesting dimpled effect on the jacket permits spot welding to the inner vessel as part of the steam jacket design. All parts are stainless steel for resistance to corrosion heat changes and ease of maintenance.

abrading action encountered in agitation and filtering operations make the stainless surface harden and toughen with use. Thus it permits lightweight, durable construction, minimum contamination at negligible maintenance and replacement costs.

Self Protecting

The protective role of stainless steel is the result of its position in the galvanic electromotive series. Remarkably, stainless steel occupies two positions, depending on the nature of the electrolyte.

In one environment—strongly oxidizing acids, salt solutions and alkalis—it occupies a position in the electromotive series closely approaching that of the most noble metals: platinum, gold, and silver; these are called noble because they resist chemical attack so effectively. Thus stainless is excellent for neutral and non-reducing conditions.

Reducing conditions cause stainless to revert to a lower position. Acid halide salts—chlorides and fluorides especially—are a signal for caution. Stagnant deareated solutions can promote localized oxidation-reduction couples. Deposits of solid material can also lead to local electropotential differences. This condition can be minimized by frequent cleaning and avoidance of surface crevices in the equipment design.

Strenuous Production Requirements

The most critical demands made on aromatic chemical production equipment are in the reaction and distillation stages. Here materials such as ethylene oxide, benzol, aluminum chloride, heptaldehyde, benzaldehyde, essential oils, etc. are mixed, heated, agitated, heated again, and cooled in the production of aromatic synthetics and isolates.

Typical of leaders in the field, van Ameringen-Haebler has long been converting from other materials to stainless. Some present reactors are of the glass lined variety, but most new units, which range in operating capacity from 100 to 2000 gallons, are constructed of stainless steel, insulated with glass fiber, asbestos, and other materials such as metallic paint to prevent heat loss. These are made of Type 316 stainless with wall thickness ranging from $\frac{1}{4}$ inch to $\frac{3}{8}$ inch.

Type 316 is an austenitic chrome nickel stainless steel with quantities of molybdenum added for exceptional resistance to chemical corrodents and excellent creep strength at elevated temperatures. These are critical properties in a production phase that consists principally of the mechanical agitation of chemicals under high heat.

Continuous Operation Possible

Continuous operation of stills minimizes possibility of contamination and circumvents repeated need for costly maintenance and cleaning during idle time. The use of stainless permits such demanding schedules without concern over breakdown or contamination.

At van Ameringen-Haebler, for example, stills are made of Type 304 stainless, an austenitic chrome nickel steel with excellent heat and corrosion resistance compatible with continuous operation conditions.

Maintenance of Stainless Equipment

Cleaning stainless steel in aromatics production equipment is simple and involves two steps. The stainless steel surfaces are cleaned with a solvent rinse such as alcohol or acetone, followed by live steam distillation to remove all traces of any aromatic product. According to van Ameringen-Haebler, the polished stainless surfaces need no other maintenance.

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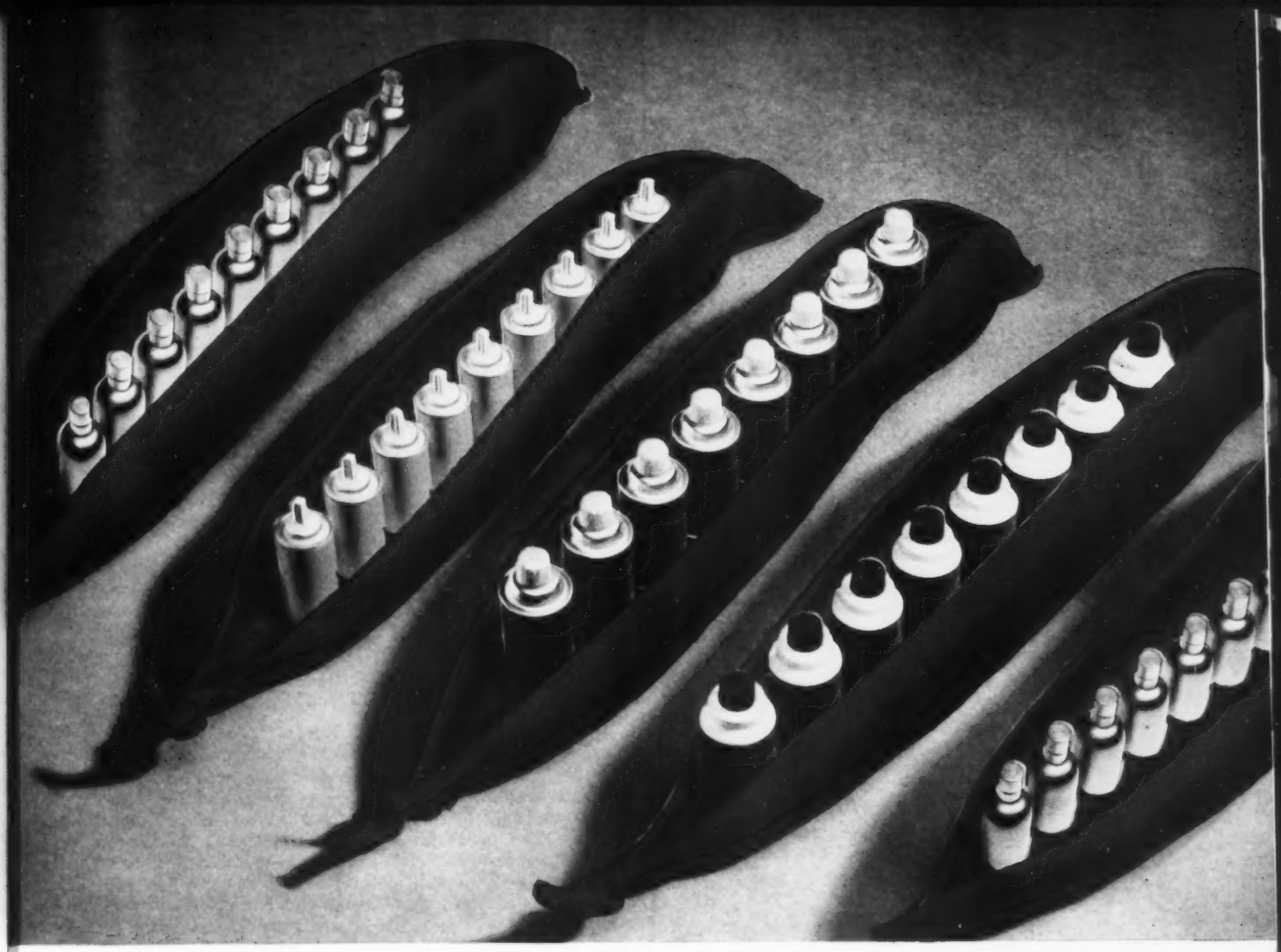

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Packaging and Promotion

1.

1. HELENA RUBINSTEIN

The "plus" feature of Helena Rubinstein's new "Convertible" lipstick cases is their speedy refill action. Pictured here are the cases, with the Refill shown in the center. From the left, the first three are the Golden Mesh, Golden Mesh and Black, and Silver Plate and Golden Mesh—at $3.50 each with Refill. The next three are the Opalescent Blue, the Platinum Tone and the Opalescent Pink—$2.00 with Refill. The final two are the Solid Brass, and the Black and Brass—$1.35, with Refill. The Color-Change Refill is priced at 90¢, plus tax.

2.

2. LITTLE LADY

For bath time fun, Little Lady is introducing this Tea Time Set. Little Lady's unbreakable "milk bottle" filled with powdered bubble bath with milk—5 colorful "cookies" and a "lemon" of scented castile soap. A plastic cup, saucer and spoon complete this gift set, priced at $3.00 plus tax.

3.

3. BOURJOIS

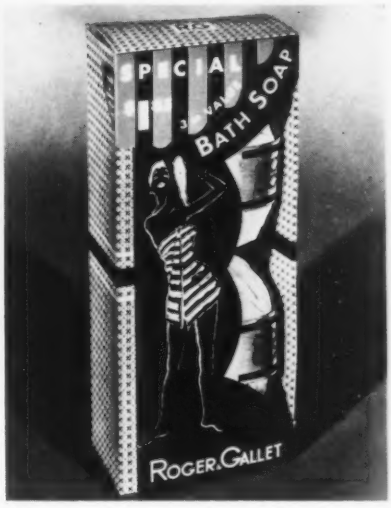
A new Evening in Paris promotion called "Two for You" has made its appearance this month. "Two for You" consists of a 1 ounce bottle of Evening in Paris Eau de Toilette and a 4 ounce bottle of Hand and Body Silicone Lotion. The star sprinkled package has been designed in graduated shades of blue and decorated with a design of deep blue and white plumes. An acetate window and perforated price tab not only serve to display the merchandise but encourage gift buying as well. "Two for You" will be sold for a limited time at the sale price of $1.00.

4. HELENE CURTIS

Helene Curtis goes all out in a 30th Anniversary celebration with six Beauty Festival specials. Shampoo Plus Egg, Creme Rinse, Lanolin Creme Shampoo, Regular Spray Net, Super Soft Spray Net, and Lanolin Discovery. Each package is labeled with the special price. To present the selection, Helene

4.

5.



6.

Curtis has designed a floor stand and header card. The feeling of Festival and Femininity is captured on the base of the floorstand with art work and is headlined, "Helene Curtis Hair Beauty Center."

5. SHULTON

Available October 1st, Desert Dri is a cream deodorant packaged in a pink plastic container, with the new automatic-applicator top. By twisting the base, the cream is released and is ready to be applied directly from the container. Desert Dri will retail for $1.00 plus tax.

6. ROGER & GALLET

Roger & Gallet has introduced a bath soap promotion with a unique package, designed to stand vertically, becoming its own counter display. It is a high-fashion black and white package which partially reveals the two large cakes of bath soap with their fragrance bands. A sketchy fashion-figure wrapped in a striped bath towel appears in reverse in black area left of package. Opening at right to show product, and awning striped price label, give the package the appearance of a small cabana. Three fragrances will be featured: Blue Carnation, Fleurs D'Amour and Sandlewood.

7.

7. YARDLEY

To command attention at the point-of-sale, Yardley offers a dramatic vertical display unit for the new Deodorant For Men. The self-service display stacks six units of the product in a clear cylinder with a pull-out device at the base for quick customer service.

8.

8. TINKERBELL

Tinkerbell's Princess Package presents an assortment of handcare essentials in a story-book package. It relates the fairy tale of "The Princess Who Sat on Her Hands." Nail polish, remover, hand lotion, emery, orange woodstick and cotton are arrayed in the book box, priced at $1.95.

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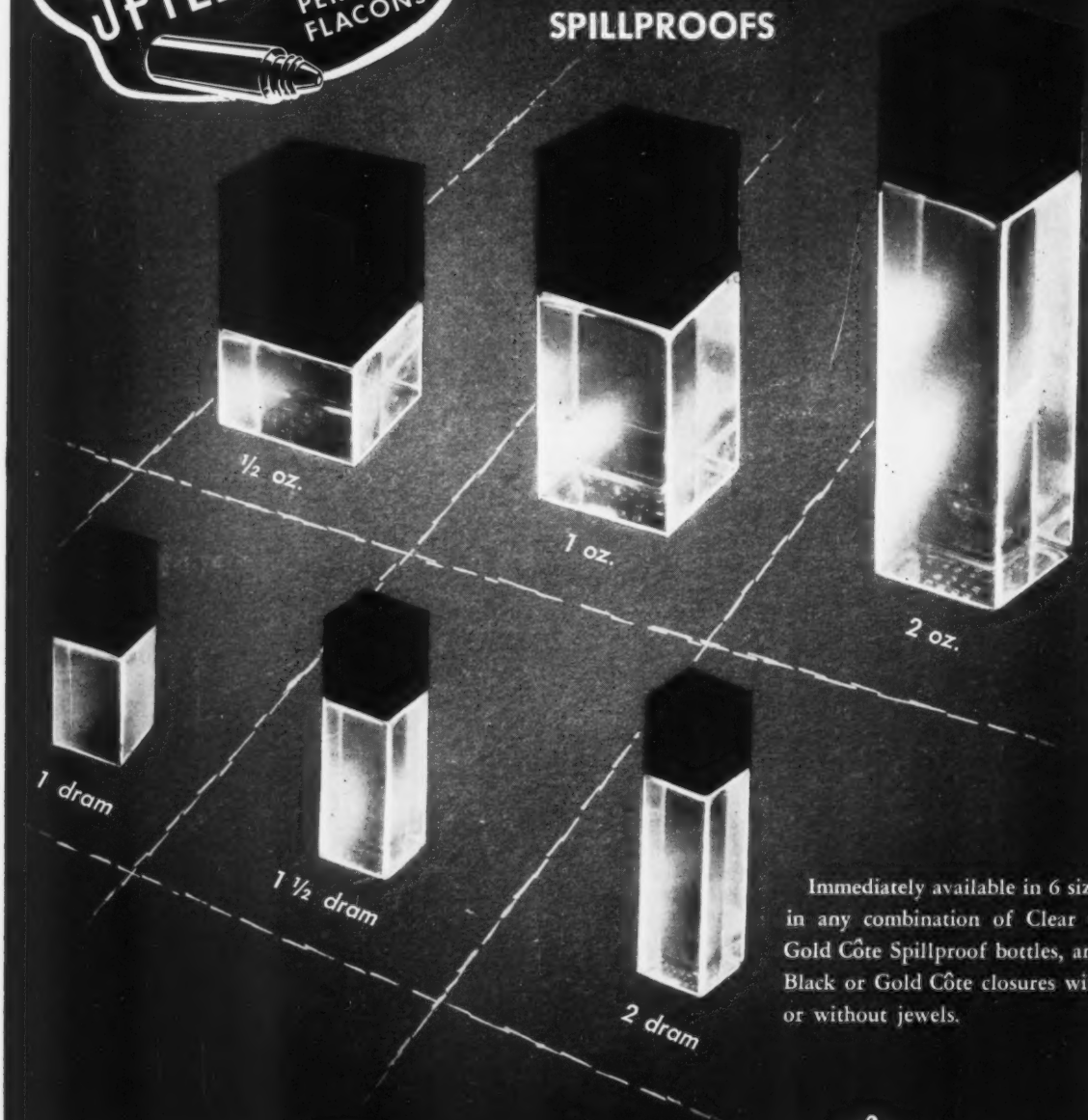

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Aerosol NEWS

by Dr. Winston H. Reed

Aluminum Containers

Quite an interesting story could be written by someone who knows the technical and business history of aluminum aerosol containers in this country. It is surprising that European use of these containers has been far more rapid and successful than the experience here. The six ounce size and over aluminum containers have had a rather uneven pattern of use over the past ten years. At the present time, there does not seem to be any major American aerosol product in the household specialties field to be found in such packages. In the cosmetic industry, however, the smaller size aluminum containers, such as that produced by Peerless, Wirz and others, are creating great interest.

The paper by Aksel Taranger, presented at the May 21st, 1957, meeting of the C.S.M.A. and reported in the July and August issue of Soap & Chemical Specialties, covers in a very interesting fashion the European experience with these containers. It would seem probable that, through the use of suitable interior coatings or by the application of aluminum inhibitors, these containers would have a greater rate of growth in the United States. Aluminum containers we have had in our laboratory on corrosion tests have done very well with certain products.

The Hunter-Douglas Division of Bridgeport Brass Company recently offered some very attractive contoured aluminum containers in the six ounce size. The metallic sheen of colored lacquers over aluminum made these very eye-catching packages, which someone should put to good sales use.

Coffee Break

How do you like yours, with or without? It may not be too long before all you have to do is pick up the appropriate can and push the little button, maybe even with a metered valve no less, add the boiling water and there you have it!

After all, perhaps the time has come when all that can be said about coffee has already been repeated ad infinitum by the copy writers and enunciated a few million times or more by the decorative and sonorous pitchmen or ladies of the TV commercials. Now at last they will have a new ball of wax to play with.

Seriously, as with powdered coffee, improved convenience will find a ready market in this country and the pressurized product does have something to offer. Powdered coffee has a low bulk density. Maybe more cups of coffee could be produced from a given size areosol dispenser, using a liquid coffee concentrate, than from the powdered type. The aerosol container has its usual advantage of being a hermetically sealed package, which would seal in the volatile oils and also prevent oxidation. The package can be considered practically spillproof. There are problems to be solved, but it's on the way.

Perhaps we can even envisage future domestic altercations wherein pressurized coffee over the breakfast table will substitute for the rolling pin.

Gas Chromatography

This relatively new but very useful analytical technique will be found of value to many of the larger aerosol laboratories. An International Symposium on Gas Chromatography, August 28th to 30th, has a number of papers of interest to those in the aerosol field. We notice Morey Root, of George Barr & Company, discussed quality control of chlorofluoro propellents by this technique. Mr. Root has done some very useful pioneering work on the application of gas chromatography to aerosol problems, which have been reported elsewhere, and his new papers should be of definite interest.

Accelerated Age Testing of Aerosols

There seems to be quite a bit of variation in the temperatures taken for accelerated age tests in the industry. In many cases, there does not seem to be a well substantiated reason for a particular choice, although 98°F and 130°F have come from the familiar bacteriological testing temperatures. Test temperatures usually run at some isotherm between 98°F and 130°F. It would seem that 100°F and 110°F temperatures are favorites. We would be very glad to have comments from any readers in regard to test temperatures that they use for aerosol work and the reasons for their preference. Uniform test temperature in the industry would certainly simplify the comparison of data obtained from different laboratories.

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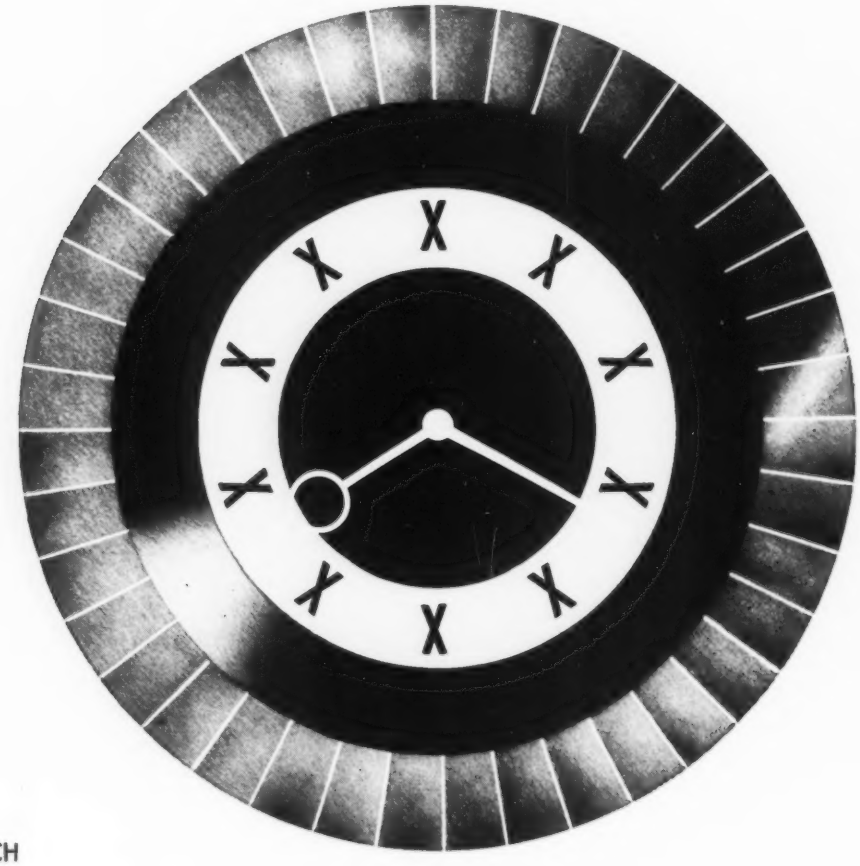

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Production and Sales of Flavor Materials

Preliminary data concerning production and sales of flavoring materials for 1956 show an increase in production and the quantity of sales but no increase in the value of sales

The United States Tariff Commission issued in June 1957 a preliminary report on the flavor and perfume materials section of their publication, "Synthetic Organic Chemicals—United States Production and Sales, 1956." The preliminary reports were issued in separate sections one of which was on flavors and perfume materials. The statistics, on the chemicals, it is stated, covered in the preliminary report usually refer to undiluted materials.

The authors of the report state that the statistics given in the tables are preliminary and somewhat incomplete. They point out, however, that the statistics include so large a percentage of United States production and sales of the chemicals covered that they may be considered to be complete for all practical purposes. The complete statistics will be given in the Commission's final report, which will be issued later.

MORRIS B. JACOBS, PH.D.

Production and Sales

This report of the Tariff Commission covers the production and sales data of flavor and perfume materials derived from natural products by actual chemical processing and those materials that are synthesized. It does not contain data on purely natural products such as floral essences, essential oils, and other materials obtained by simple extraction or by distillation from natural vegetable and animal sources.

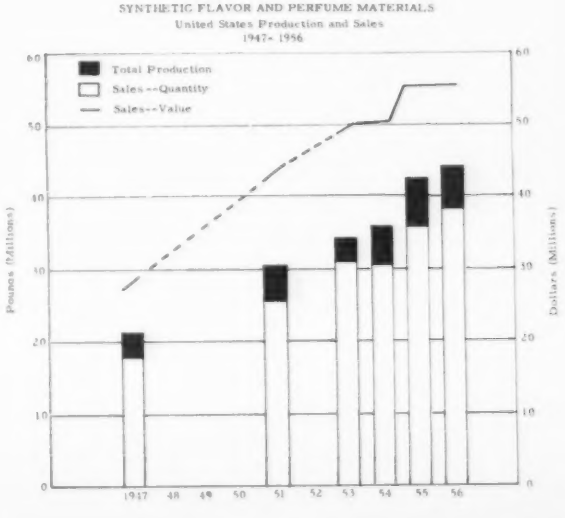
For the purposes of the Tariff Commission preliminary report and also for the purposes of this review, the flavor and perfume materials are grouped depending on their chemical structure as either cyclic or acyclic substances. The cyclic substances are further subdivided into (a) benzenoid and naphthalenoid substances and (b) terpenoid, heterocyclic, and alicyclic substances.

As I pointed out in my review of the data for 1954 and 1955, it is regrettable that for a number of important flavor and perfume materials such as vanillin, it is not possible for this agency to present any data. It is to be noted that the trend toward giving data for a lesser number of compounds as compared with data issued for 1953 which contained data for 71 synthetic chemicals, and for 47 in 1954 was stopped. Data are given for 43 chemicals in this report as contrasted with data for 42 compounds in the 1955 report. Data is again included for ethyl methylphenylglycidate, (ethyl alpha, beta-epoxy-beta-methylhydrocinnamate) in the 1956 report. The data omitted, in general, covers

SYNTHETIC FLAVOR AND PERFUME MATERIALS

United States Production and Sales
1947-1956
(thousands)

Year	Production pounds	Sales Quantity pounds	Sales Value dollars
1947	20,879	17,896	26,062
1951	29,806	25,308	40,499
1953	33,871	31,080	46,528
1954	35,307	30,794	47,280
1955	41,974	35,843	52,555
1956	43,842	38,503	52,518



compounds made in smaller quantity. The data presented depends in large measure upon the cooperation of the industry in supplying the necessary information.

The quantity of sales in 1956 totaled 38.5 million pounds, valued at 52.5 million dollars compared with a sale of 36 million pounds, valued at 53 million dollars in 1955 representing in 1956 an increase of 2.5 million pounds in sales but a decrease of 0.5 million in the value of the sales over that of 1955.

The production of flavor and perfume materials in 1956 reached 43.8 million pounds which was an increase of 1.8 million pounds over 1955.

The variations in production, sales, and sales value from 1947 through 1956 are tabulated in Table I and are shown graphically in the figure.

Benzenoid Compounds

The production of benzenoid and naphthalenoid flavor and perfume materials in 1956 was 15.2 million pounds representing an increase of 1 million pounds over the 14.2 million pounds produced in 1955. Sales of compounds of this group were virtually the same in both years 12,616,000 pounds in 1956 and 12,654,000 in 1955 and the value of the sales was virtually the same in both years also totaling some 16 million dollars.

The substance produced in greatest amount in this group of aromatic chemicals and having the largest sale was artificial oil of wintergreen, that is, methyl salicylate. In 1956, the production of this compound totaled 3.5 million pounds, an increase of 400,000 pounds over that made in 1955. Sales of methyl salicylate totaled 3,283,000 pounds valued at $1,664,000 compared with 3.4 million pounds valued at $1,623,000 in 1955 so that sales of this compound were slightly less in 1956 at a slightly higher value than in 1955. It is to be noted that the production of methyl salicylate in 1956 was greater than that of 1953 when M 3.2 million pounds were produced.

Information is given for only 17 compounds in this group, the same as that given in 1955, but far less than for the 26 compounds for which data were given in 1953. In order of magnitude, the production in pounds was: methyl salicylate (3,518,000), anethole (1,360,000) (a small decrease from the 1.4 million pounds made in 1955), phenethyl alcohol (1,082,000), benzyl acetate (715,000 a marked increase over the 432,000 made in 1955), benzyl alcohol (673,000), alpha-amylcinnamaldehyde (306,000), benzyl benzoate (157,000), eugenol (123,000), benzophenone (114,000), isoeugenol (73,000), isobutyl phenylacetate (25,000), 3-phenyl-1-propyl alcohol (hydrocinnamic alcohol) (13,000), benzyl propionate (8,000), ethyl methylphenylglycidate (7,000), and *p*-methoxy-acetophenone (6,000).

Data are given in the 1956 report on benzophenone, benzyl benzoate, ethyl methylphenylglycidate, and *p*-methoxyacetophenone for which no data was given in the 1955 report. On the other hand, the 1955 report carries information on anisaldehyde, benzyl cinnamate, benzyl salicylate, methyl cinnamate, and phenethyl acetate and no data is given for these compounds in the 1956 report.

All other benzenoid and naphthalenoid materials manufactured for flavor and perfume purposes totaled 7,009,000 pounds. The total production for all cyclic compounds was 24,594,000 pounds of which 15,189,000 were in the benzenoid group and 9,405,000 was in the terpenoid group.

Terpenoid Compounds

Data on production in the 1956 report is given for 23 compounds in the terpenoid, heterocyclic, and alicyclic group. Total production in this group showed a drop from 1955, for 9.4 million pounds were produced in 1956 as compared with nearly 9.9 million pounds in 1955. Sales were virtually the same in both years: 7,459,000 pounds in 1956 as compared with 7,490,000 in 1955; the drop in the sales value is noticeable: $14,598,000 in 1956 and $14,817,000 in 1955.

The most important aromatic chemicals in volume of production in the terpenoid category were the terpineols, alpha-, beta-, and alpha- + beta-terpineol. The production of these compounds totaled 2.1 million pounds as compared with 2.5 million in 1955. Sales were 1.9 million pounds in 1956 and 2.3 million in 1955 valued at $532,000 compared with $576,000 respectively.

No data were given on the synthetic menthols and these are among the more important in sales value of this group. The next most important compound in production and the most important in sales was coumarin with 738,000 pounds being produced, 621,000 pounds being sold at a value of $1,863,000. The methylionones were next in importance in value of sales; 249,000 pounds were produced, 226,000 pounds were sold at a value of $1,283,000. Following in importance was geraniol: 381,000 pounds produced, 279,000 pounds sold at $951,000.

In order of production the remainder of the compounds mentioned in this group were: terpinyl acetate (304,000 pounds), heliotropin (piperonal) (249,000), citronellol (246,000), citronellal (224,000), ionones (196,000), safrole (194,000), and hydroxycitronellol (148,000).

Compounds in this group for which the production was over 10,000 pounds were: citral (91,000) (this was nearly twice as much as was made in 1955), linalyl acetate (62,000) linalool (58,000), cedryl acetate (43,000), ethyl oxyhydrate (32,000), alpha-ionone (31,000), geranyl acetate (21,000), citronellyl formate (13,000), terpinyl propionate (12,000), and vetivenyl acetate (10,000). In 1956, 7,000 pounds of citronellyl acetate and 5,000 pounds of geranyl formate were manufactured. The production of all other terpenoid, heterocyclic, and alicyclic materials including chemically modified essential oils was 3.9 million pounds; 3.1 million pounds were sold at a value of $6,340,000.

Acyclic Compounds

Production of flavor and perfume materials in the acyclic group totaled 19.2 million pounds in 1956 as compared with 17.9 million pounds in 1955. This increase of 1.3 million pounds was modest in comparison with the 4.5 million pound increase in 1955 over 1954. Practically all of this increase is attributable to the increase in production of monosodium glutamate, namely 17.8 million pounds in 1956 and 16.5 million in 1955 with only 12.8 million in 1954. Sales of monosodium glutamate in 1956 total 17.3 million pounds at a value of $20,761,000. While the sales were nearly 2.6 million pounds more in 1956 than in 1955 (14,717,000) there was little difference in the value of the sales for these values were $20,761,000 in 1956 and $20,839,000 reflecting the marked drop in unit price which was 1.20 in 1956 and 1.42 in 1955. Indeed this drop in value accounted for more than the entire drop in value of sales of the flavor and perfume group from 1956 over 1955.

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Again it can be pointed out that the value of sales of monosodium glutamate exceeded the value of either the entire terpenoid group or the benzenoid group and was equivalent to about 80 per cent of the value of both groups.

Data are given for four other compounds in this group: ethyl butyrate (156,000 pounds), isoamyl butyrate (27,000), allyl caproate (5,000), and isoamyl formate (4,000). The production of all other materials included in the acyclic group totaled 1,235,000 pounds; 944,000 were sold at a value of $876,000.

IMPORTS OF VANILLA AND TONKA BEANS DURING THE FIRST QUARTER OF 1957

Monthly statistical data on importation of vanilla beans and tonka beans during the first four months of 1957, as compiled by the U. S. Department of Commerce is as follows. The compilation sets forth the pounds, dollar value, and country of origin received from during said respective months. The subtitle "Other Cty." includes countries from which imports are less than $10,000.

1957 Vanilla Bean Imports

Country	*Lbs.*	*Dollar Value*
French Pacific Islands	12,559	67,391.
Madagascar	28,665	149,605.
Other Cty.	3,529	16,389.
(January) TOTAL	44,753	233,385.
Mexico	14,080	67,733.
French Pacific Islands	9,389	47,833.
Madagascar	108,097	567,123.
(February) TOTAL	131,566	682,689.
Mexico	17,352	73,214.
French Pacific Islands	8,130	47,660.
Madagascar	148,458	842,978.
Other Cty.	146	947.
(March) TOTAL	174,086	964,799.
Mexico	25,508	159,406.
French Pacific Islands	10,977	66,737.
Madagascar	142,961	915,579.
Other Cty.	2,138	6,672.
(April) TOTAL	181,584	1,148,394.

1957 Tonka Bean Imports

Other Cty.	6,764	4,420.
(January) TOTAL	6,764	4,420.
No Imports for the Month of February.		
Other Cty.	6,457	5,106.
(March) TOTAL	6,457	5,106.
Other Cty.	264	317.
(April) TOTAL	264	317.

JOHN S. HALL

A Plea for Small Business

Small business, in the midst of record-breaking prosperity, is in trouble. Bankruptcies and failures are mounting. To date, there have been more failures among small businessmen this year than in any year since 1939. Cautious estimates by Dun & Bradstreet indicate that in 1957, over 13,000 small businesses will be wiped out—unless the present trend reverses itself.

The failures are concentrated in retailing, small manufacturing and home building. This has been going on for some time. The U.S. Senate Small Business Committee, for example, reports that in 1956, small business failures totaled 12,686. This represents a 16 per cent increase over 1955 and a post-World War II high.

Are enough people taking the plunge of opening up their own business to offset the alarming increase in failures among small businessmen? The answer seems to be no. During the five years from 1951 through 1955, for example, only 39,000 new business enterprises opened their doors each year, on the average. In the 20 years from 1930 through 1950, an average of 53,000 firms hung out their signs each year. Since 1950, therefore, there has been a 26% decrease in the number of new businesses opening every year.

Why is small business confronted with the growing threat of failure in the midst of a boom? The U.S. Senate Small Business Committee has some answers. One is the constantly rising costs of labor and materials. Another is the heavy tax burden which never allows the small business man to get off the hook. A third is the tight money situation which makes it harder and harder for the little man to get bank loans, even at high interest rates. Then there is the growing trend toward mergers of little companies with big ones.

And of vital importance, there is the squeeze of cut-throat competition—such as price wars on the popular brands which constitute the independent retailer's bread and butter.

To prevent this destructive competition from creating chaos in the marketplace, rules of fair competition are needed.

The fair trade laws are rules of fair competition and fair play over the counter. Enacted by 45 state legislatures, these laws have been supported by Congress and upheld by the U.S. Supreme Court and 16 high state courts. But today, in 10 states, courts have knocked out fair trade and new legislation is needed to give small business an opportunity to compete on fair terms with big business.

Independent businessmen simply are not equipped to survive the low blows of unfair competition.

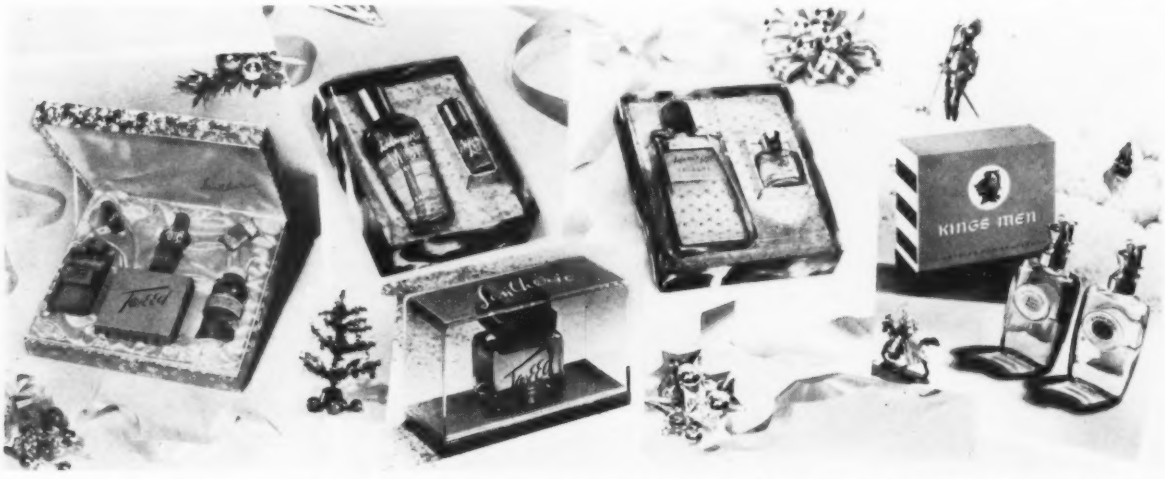
In the absence of fair laws of competition, small businessmen, in order to survive, would need lots more dollars—which they don't have.

What is the average citizen's stake in keeping the small businessman from becoming a vanishing American? What would America be like without small business? For one thing, it would be a collection of supergiant businesses, so big and so tough that they would inevitably invite control by a super-big and super-tough government. This is not the road to democracy. That the threat of a monopoly by bigness is not an idle one is indicated by the recent statement of a big industrialist who said:

"I think that, if our economic system is to continue, we must have smaller businesses developing, otherwise competition will be eliminated in the next 5 to 10 years, and we will end up with one, or possibly two large companies in each of the major fields."—*Dr. John W. Dargavel in Credit Executive Magazine.*

Christmas Packaging

From left to right: Seaforth's Scots Guard, $2.00 plus tax. The shako topped head of the Scot decorates a bright red gift box that opens like a book, revealing four jugs of Seaforth Grooming Aids for Men. Shave Lotion, Men's Cologne, Talc, and Hairgroom are the items included; Plaid Set, $3.00 plus tax. After Shave Lotion and Stick Deodorant both covered with plaid and capped with golden tops; Travel Kit, $5.00 plus tax. This red-and-black plaid zippered carryall, with yellow rubberized lining, comes equipped with plastic bottles of Shave Lotion, Men's Cologne, Talc, and Spray Deodorant; Barber Pole, $1.00 plus tax. Inside the red and white box, crystal clear jugs of Seaforth's Shave Lotion and Men's Cologne.



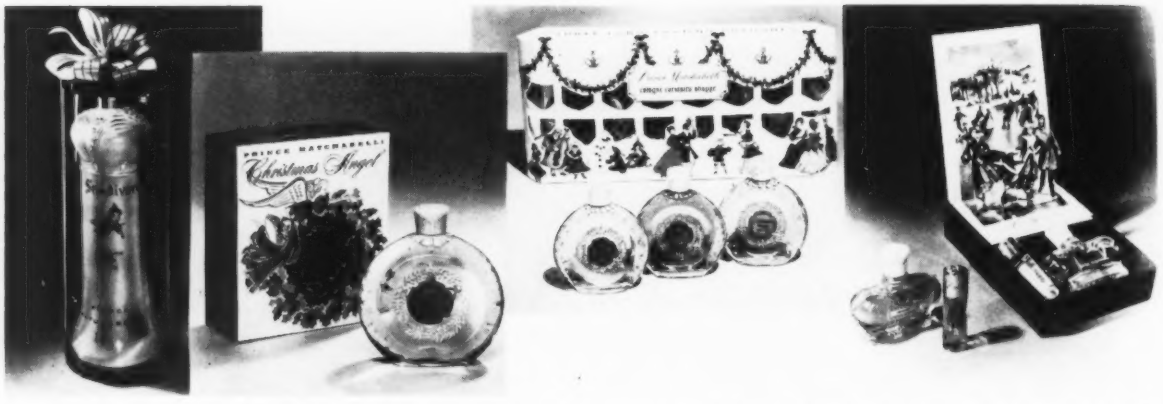
By Lentheric, for Christmas "Eves," this Tweed Deluxe 6 Piece Set consisting of Cologne, Mist, Bath Powder, Jeweled Purse Perfume and Cream Sachet, $12.50 plus tax; next to the right, Adam's Rib in two fragrance forms, Jeweled Perfume Purser and Toilet Water Mist, boxed in green, yellow and white, and covered with an acetate top. For the set, $6.50; now Tweed, in a crystal bottle capped in richly-grained wood and encased in a transparent showcase box of plastic. Tweed Perfume, 1 oz. $14.00; Adam's Rib Cologne and Perfume Set. $7.50 plus tax. Packaged in a dramatically designed box of vivid greens, yellow and white, with embroidered gold mesh veiling the bottles, covered with acetate top; On the right, for Christmas "Knights," Kings Men Crown Crystal Duo, two crystal flagons of After Shave Lotion and Thistle and Plaid Cologne, capped with golden knights' helmets. The Duo, $3.50 plus tax.

"Quadrille"—from Coty's "Isle of Treasure" Gifts for Christmas 1957. Coty's famous foursome—L'Origan, L'Aimant, "Paris" and Emeraude in complementary shaped bottles of modern design holding one-half ounce each of perfume. The cleverly designed package harbors smart black individual gift cartons fitted into the four corners for separate giving. Price: $4.50 (plus tax). At right, two tub-time favorites—toilet water and dusting powder gleaming through a transparent package framed in lace. $3.95 plus tax.

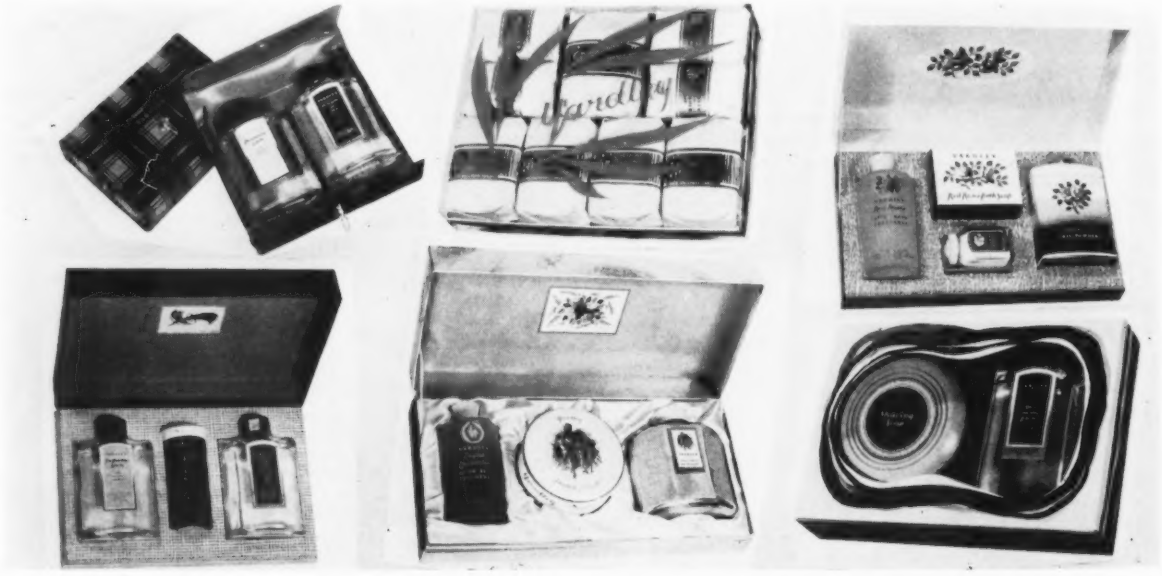
Lanolin Plus presents these three gift sets. #8308, Lanolin Plus All Over Body Lotion, gift cartoned in gold with lace-trim design. $1.50 plus tax. #8306, three pieces, Lanolin Plus Liquid, Lanolin Plus For The Hair, Lanolin Plus Hand Lotion. Retail price $3.00 plus tax. Packaged in gold setup box with full acetate cover. #8309, Lanolin Plus Hand Lotion with dispenser, gift cartoned in gold, lace-trim design. $2.25

Sportsman attracts the eye of the fisherman with this real he-man gift idea. This fishing creel is filled with five Sportsman preparations. D-Bar Solidified Deodorant, Antiseptic-Deodorant Body Powder, Shower Bath Soap, Cologne for Men, and Shaving Lotion. (A non-fisherman will find the creel a handsome and useful "catch-all.") Complete, $10.00 plus .43¢ tax.

From Max Factor, left to right: Pet Poodle. The fragrance, Electrique, in a sequined poodle of Electrique blue. 1¼ dram, $1.50 plus tax. Next, Primitif, Wound and sealed in gold, one ounce, $18.00, plus tax. On the right, Sophisti-cat, with twinkling green eyes and sequined fur, Sophisti-cat holds 1¼ drams of Primitif perfume. $1.50 plus tax.



From the left: Stradivari Bubbling Bath Salts, $3.50 plus tax. Gift packed in a clear cylinder, tied-and-bowed with gold-threaded pink satin ribbon; Christmas Angel Cologne, $2.00 plus tax. Packaged in green, red and gold on the white box, with the angel also in gold; Cologne Curiosity Shoppe, $1.65 plus tax. A gift of fragrance package decorated with holly and holiday scenes in the Old English tradition. Displayed behind snow drifted windows are three one-ounce flask bottles of Prince Matchabelli cologne favorites; Collector's Items, $3.50 plus tax. A Currier & Ives print of a winter skating scene inspired the design of Collector's Items. The print is reproduced in full color on the cover of the dark green box. Inside, a one-ounce crown of cologne and a purse dispenser of matching perfume in either Added Attraction or Beloved.

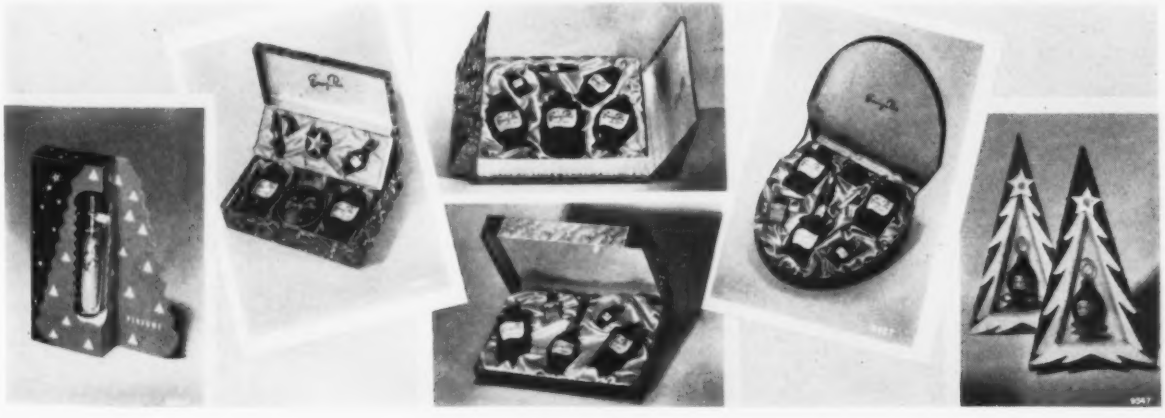


Bottom left, a trio of Yardley men's grooming aids, consisting of Deodorant for Men, Pre-Shaving Lotion and Cologne for Men, is one of the new offerings in the Christmas gift line; above, the Yardley Travel Gift Pair. A red plaid kit containing Yardley Pre-Shaving Lotion and Cologne for Men. The new kit comes in a silk-finish plastic, water-proof and light weight for travel convenience. It retails at $2.95 plus tax; And for the ladies, Yardley Lavender. This bath trio of After Bath Freshener, a jar of bath salts, and dusting powder retails at $6.50 plus tax. The holiday box is covered with a white and gold wrap and lined with white satin; Top center, a treasure chest of soap, one bath size, four hand size, and four new guest size, scented with lavender. $4.50; Bottom right, the Yardley Men's Set, a combination of two men's toiletries, Wooden Shaving Bowl and After Shave Lotion in an acetate covered gift box. $2.45 plus tax; Top right, four favorites from the Yardley Red Roses line are combined in a rose and pink package. After-Bath Freshener, sachet, talc powder and bath soap, all perfumed with the authentic rose fragrance. $5.95 plus tax.

Two Christmas specials from Roger & Gallet. At left, Christmas Ball, a gay soap bauble to hang on a tree or stuff in a stocking. French hard-milled Hand Soap. Color wrapped, in silvery see-through ball. Blue Carnation, Fleurs D'Amour, Sandalwood, $1.00 retail. Above, Fragrance Treasure Box, Fragrance matched soap and cologne in lucite treasure box for hankies, hose, jewels or bows. Blue Carnation, Fleurs D'Amour, Sandalwood, Violette de Parme, $3.25 retail.

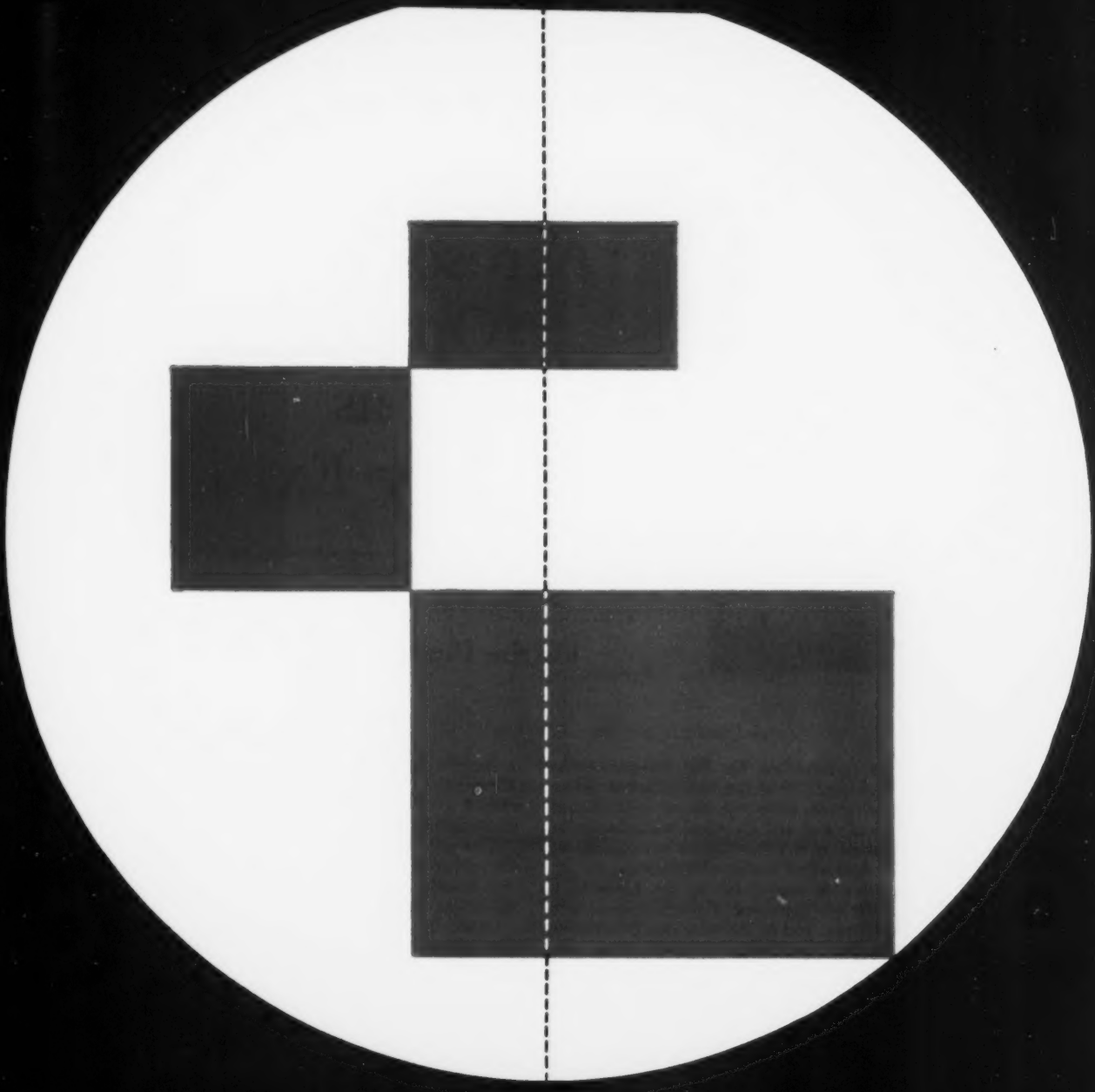
A new and novel approach to the displaying of Christmas Gift Sets is being offered by Cutex. The peg board construction of this deal takes up little counter space and gives clear set visibility. This deal contains 24 Cutex Manicure Sets with retail prices within the $5.00 range.

From left to right: Evening in Paris Gold Purse Perfume Flacon in gift carton, $1.00; Gift box, Cologne, Eau de Toilette, Perfume, Purse Perfume Flacon, Solid Perfume and Face Powder, $10.00; Top, Gift box, Cologne, Eau de Toilette, Perfume, Purse Perfume Flacon, Talcum Powder and Perfumed Bubble Bath Oil; Bottom, Music Box containing Eau de Toilette, Perfume, Purse Perfume Flacon, Talcum Powder, Liquid Sachet Perfume and Perfumed Bath Crystals, $10.00; Next right, Gift box 9427, Eau de Toilette, Perfume, Purse Perfume Flacon, Solid Perfume, Liquid Sachet Perfume, Talcum Powder, Perfumed Lotion and Lipstick, $12.50; Extreme right, Perfume in blue or cerise Christmas tree gift ornament package, $2.50. All prices plus tax.



A BUILDING BLOCK

FOR YOUR SUCCESS!



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Aerosol Scientists Optimistic as Industry Expands

Notes on first Symposium for the Pharmaceutical Industry

The first Aerosol Symposium for the Pharmaceutical Industry was held August 20 at the Philadelphia College of Pharmacy and Science, with representatives of practically every phase of drug and chemical manufacturing, packaging, marketing and consultation in attendance, along with members of allied trade publications.

The program was ably moderated by Dr. Linwood F. Tice, Associate Dean and Director of the Department of Pharmacy of the college, and as the program progressed, the hours spent in organization and planning were very much in evidence, relating directly to the work of Martin Barr, Lawrence Hall, Robert A. Foresman, Jr., David S. Tillotson and Harvey Tull, the members of the program committee.

After a welcoming speech by Dr. Ivor Griffith, president of the Philadelphia College of Pharmacy and Science, the main speeches got underway, headed by The Aerosol Market by Thomas D. Johnson, Jr., manager of Aerosol Propellent Sales, E. I. DuPont, discussing, in his authoritative drawl, the types of Aerosols on the market, sales records since their introduction, and the aerosol future.

The next major topic of the morning session was The Aerosol Package, discussed as Typical Aerosol Systems and Propellents, Aerosol Containers, and Aerosol Valves, by respective experts in each particular phase of aerosol packaging. David S. Tillotson, head of Isotron Sales Service of Pennsalt Chemicals Corp., discussed types of aerosol systems, space sprays, foams, powder aerosols, two phase and three phase systems and physical and chemical properties of propellents. After a short intermission for coffee and refreshments, the program continued with an informative presentation of types of metal cans, uncoated and coated glass containers, and plastic containers, by W. Earl Graham, division manager of research of the Crown Cork and Seal Co. Concluding the morning program, Walter E. Beard, Jr., director of research of the Risdon Manufacturing Co., spoke about types of valves, special applications and spray characteristics.

After the luncheon, the afternoon program began with a lecture by Dr. Martin Barr, Associate Professor of Pharmacy, PCPS, on the advantages of aerosol dosage forms in pharmaceuticals, pointing out the types of preparations that lend themselves to such systems.

The afternoon intermission was overlooked so that the program might continue on schedule. The concluding speaker was Robert A. Foresman, Jr., speaking on Entering the Aerosol Field. A prominent aerosol consultant, Mr. Foresman discussed private or contract development, private or contract filling, cost, and many

other factors that a manufacturer must consider before attempting to market his product in aerosol form.

The group now had the good fortune to listen to a short discussion by William Tarpley of Aero-Projects, Inc. on the measurement of Aerosol particle size. After the question had arisen during the morning session, Mr. Tarpley consented to a request by Dr. Tice that he talk about various methods used to determine particle size, and very ably obliged.

To conclude the symposium, Dr. Tice presented each speaker again to review his conclusions and allow questions from the group, after which the symposium was adjourned, each representative returning to his particular phase of the industry, bringing a new product, a new package, a new valve, closer to the consumer market.

Floramoss

Suggestive of woodland odors, this delightful fragrance is derived from a unique blend of light brilliant florals to which has been added a fresh green character for modification. This, with other additives, results in an attractive bouquet of intense sweetness and appeal. A strong, heady, provocative fragrance with tremendous lift and tenacity.

Vibrato

This is a fragrance that will heighten the wearer's beauty and lend color, intensity and warmth to her personality. Oriental in type, it is composed of exotic oils with a blend of oak moss. Added to this are certain delicate florals and spices for bouquet, and a light diffusive aldehyde for topping. It is stable, long-lasting and moderately priced for extracts, colognes and toilet preparations in general.

Taz-e Mah

In the skilled blending of scents that constitute this perfume's lovely top-note, you'll find only faintly concealed the underlying warmth and richness of its basic oriental character. This is a fragrance that has beauty, seductive charm and elegance.

A PORTFOLIO of PERFUMES . . . .

Here, briefly described, are six outstanding fragrances offered for the consideration of discriminating perfumers. From this varied selection you may find just the type desired for your new line of extracts, toiletries and cosmetics. We invite your serious consideration of these exclusive offerings.

FRITZSCHE BROTHERS, Inc.

HÓALÓHA

Truly a "beloved companion" as its name implies—an appealing, long-lasting, semi-oriental fragrance for extracts, toilet waters and colognes. A unique blend of spices on a woody, resinous foundation, lightly touched with rose.

Éclatant

A typically French type of perfume—stylish, elegant, distinctive. Has a warm, woody, balsamy base attractively topped with smoothly blended florals. The exquisite character and quality of this fragrance suggest unlimited potentialities for sales.

FIRE DANCE

A composition of many moods and contrasts—a bright, sparkling fragrance for a luxury line of extracts, toilet waters and colognes. We suggest you try this perfume and let it help fire your imagination with its vivid and unforgettable beauty.

Physics, chemistry and the newest advances in electronics are being utilized in the Instrumental Laboratory of our Clifton plant to help develop and maintain the quality and uniformity of product that is traditional with our firm. Through the employment of spectrophotometry, it is now possible to record, for precise evaluation, the ultraviolet, visible and infrared properties of our products; also to maintain more accurate control of our raw materials and to select those that will be productive of finer grades and better yields. In addition to these quality gains, the facilities of this Laboratory contribute importantly to our continuing research, as well as to the development of new and more efficient analytical techniques, and to the study and synthesis of greatly improved replacements for certain hard-to-get, higher priced oils.

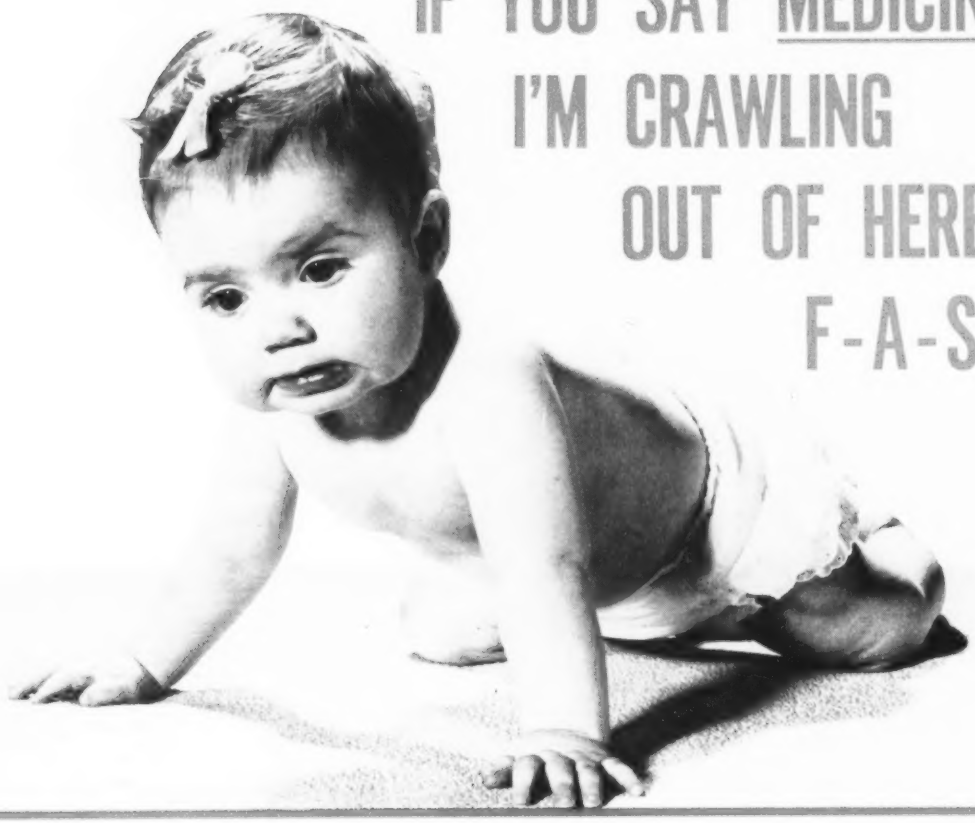
FRITZSCHE *Established* 1871

Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F.* FACTORY: *Clifton, N. J.*

IF YOU SAY MEDICINE . . . I'M CRAWLING OUT OF HERE F-A-S-T!



"That's one word I just hate to hear mentioned, because for me it usually means trouble. Mind you, I don't object to nice-tasting medicines, but when Ma or the doctor force me to take these nasty, bitter remedies (which—according to them—are always "for my own good") that's when I act real mean and mad. Gee, some of the stuff they have now to make us kids healthy really does taste good, and whenever I take that kind of medicine, I actually do feel healthier. But why can't they make all medicines taste good?"

* * * *

. . . . . The truth is, even the most unpalatable substances used in pharmaceutical compounding can be made more acceptable by the discriminate use of appropriate flavors. Having pioneered in this field for many years, and having given special attention to the flavoring idiosyncrasies of each new drug ingredient upon its introduction to the trade, our Pharmaceutical Flavor Division is well prepared to help you work out a solution to any problem you may care to present for our consideration.

For GOOD TASTE

in Pharmaceuticals *Consult* . . . . . .

FRITZSCHE *Established* 1871

Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES *and* *STOCKS: *Atlanta, Georgia, Boston, Massachusetts, *Chicago, Illinois, Cincinnati, Ohio, *Los Angeles, California, Philadelphia, Pennsylvania, San Francisco, California, St. Louis, Missouri, Montreal and *Toronto, Canada and *Mexico, D. F.* FACTORY: *Clifton, N. J.*

News and Events

First International Meetings of Cosmetic Chemists Marked Success

Under the sponsorship of the Society of Cosmetic Chemists, 51 delegates participated in cosmetic seminars in Paris and Geneva and in an important scientific symposium in London. Meeting with executives from several other countries, the American representatives discussed the organization of a world-wide network for the rapid exchange of technical information useful to the industry.

In Paris the U. S. delegates played an essential part of the First International Cosmetic Congress, organized by the Societe Francaise de Cosmetologie. Led by President Sabbat J. Strianse, SCC officers participated in exploratory talks with officers from ten countries interested in an international federation of cosmetic societies. Three SCC members presented papers at the scientific session in Paris, July 30; they were M. G. deNavarre, Dr. Irwin I. Lubowe, and Samuel Cohen.

Delegations to the International Congress were honored with a banquet presented by the Societe Francaise de Cosmetologie and presided over by M. Louis Schmuck, secretary general of the SFC. The House of Guerlain and the Jean d'Athene Institute gave receptions and demonstrations for the visitors. They also toured the new Coty plant and laboratories near Paris and visited the Pasteur Institute.

The U. S. group arrived in Geneva on the Swiss national holiday, August 1, and was received by the Mayor of Geneva in his official palace. In his welcoming speech, the mayor pointed to Geneva's significance as an international center for scientific studies. He also noted the contributions of the perfume industry to the city's prosperity. The world's producers of synthetic perfume materials—Firmenich & Co., and Givaudan & Co.—showed their Geneva plants and laboratories to the U. S. executives. The historic villas of Andre Firmenich and Xavier Givaudan were the settings of two informal parties to strengthen the ties between American and Swiss cosmetic chemists.

"We look at you when we need inspiration about where our industry should go or understanding on how scientific knowledge should be utilized in cosmetic technology," President Kurt Pfeiffer of the Swiss Society of Cosmetic Chemists told the American Society. The two societies held a joint seminar at the University of Geneva. Seven Swiss scientists and three Americans presented papers. Edward P. Morrish and Dr. D. H. Powers, seminar co-chairmen for the U. S. Cosmetic Chemists, praised the high standards of the Swiss section, and expressed the hope that more joint meetings would follow in future years. While in Switzerland the U. S. delegates were also guests of Tokalon International, Aevel Laboratories and the governor of Valais.

The cosmetic chemists were in London August 6-11 and attended the three-day symposium on the Biology of the Hair. They were at the symposium at the personal invitation of Dr. Robert A. Marriott, past president of the SCC in Great Britain and director of County Laboratories, Ltd. County Laboratories (research affiliate of Brylcreem) lent financial support to the symposium which was held at the Royal College of Surgeons under the sponsorship of the British Society for Research on Ageing. The directors of Brylcreem invited the delegates to a reception and the British Society for Research or Ageing invited them to a dinner meeting. President Jack Pickthall and Secretary F. Riley of the British Society of Cosmetic Chemists feted the American cosmetic chemists at a supper party. Officers of the two cosmetic societies also had joint meetings; the American and British groups have coordinated their programs and policies since the founding of the Great Britain SCC. The U. S. executives also met the leaders of the British cosmetics industry at a reception by the Toilet Goods Producers Assn.

"We greatly appreciated the hospitality extended by our colleagues abroad," says Robert A. Kramer, secretary of the SCC and leader of the U. S. delegation. "It was gratifying to find that our American toilet goods industry enjoys such high respect abroad. As the managers of scientific and technical activities, our group was proud too of the opportunity to represent management. Being sent abroad indicates the high prestige cosmetic chemists have attained."

In addition to President Strianse and Secretary Kramer, other SCC officers on the tour were S. F. Coneybear, director and chairman; M. G. deNavarre, H. J. Amsterdam, E. P. Morrish, and Walter Wynne, chairman of standing committees; D. H. Powers, past president and chairman; Audrey Langdon, press representative; and Mariam C. Aarons, assistant editor of the SCC Journal. Among the delegates were Harry Bennett, Dr. Murray Berdick, Samuel Cohen, J. E. Garizio, S. R. Goff, Dr. Samuel Grant, D. Hansell, J. Hirschhorn, Dr. Chase B. Jones, J. Gerald Kakehashi, Dr. H. R. Kreider, Dr. Irwin Lubowe, R. A. Malmstrom, A. Minton, Sophie Plechner, Dr. Wilhelm Reiss, M. L. Rosenthal, H. C. Ruhf, Mrs. Maria Wiener, and Constantine Zannis.

Risdon Charges V. C. A. With Patent Infringement

The Risdon Manufacturing Co. recently filed suit against V.C.A., in the U. S. District Court in Connecticut. Infringement by V.C.A. of Risdon's "Micro-Mist" aerosol spray nozzle patent No 2,767,023 is charged. P. H. Sagarin, president of V.C.A. has released this statement. "It has never been the intention of V.C.A. now or ever, to infringe on anyone's valid patents, because V.C.A. would expect all their patents to be respected. With regard to the Risdon Patent on Mechanical Break Button, V.C.A. has made a very thorough search, and believe that in no way are they infringing. It is for this reason that V.C.A. is holding all their customers harmless, and V.C.A. is certain that if the matter ever goes to Court, the decision will be in V.C.A.'s favor."

Stanley Park of Luft-Tangee Celebrates Wedding Anniversary

Stanley Park of Luft-Tangee (London) Ltd. and Mrs. Park celebrated their 36th wedding anniversary August 3. Mr. Park is well known throughout the United States for his ten years of association with the Northam Warren Corp. before joining the George W. Luft Co. in 1939. After serving that company in the United States with marked success he assumed the management of the London company arriving there August 3, 1949 which by coincidence was also the date of his wedding anniversary. Since that time he has developed considerable business for his company. A recent visitor was Irving MacPherson, a vice president of the parent company in the United States.

Maurice Couderchet Returns from European Trip

Maurice G. Couderchet, president of Charabot & Co. New York is back from a visit with the parent company in Grasse, France.

Arthur C. Gogarty Back from Grasse, France

Arthur C. Gogarty, Tombarel Products Corp., New York who spent three weeks in the Grasse, France area inspecting crop conditions and discussing sales plans with the parent company has returned.

Dillinger Establishes VAH Service Record

Albert J. Dillinger (left) is congratulated by Charles P. Walker, President of van Ameringen-Haebler, Inc. on the forty-second anniversary of his employment by the company. Mr. Dillinger, one of the nation's well known perfumers, and a past president of the American Society of Perfumers has the distinction of being VAH's oldest employee in length of service. During his career he has seen the company grow from five employees to almost five hundred. He can recall, too, when this nation's fragrance industry was dependent entirely upon foreign sources and used relatively few raw materials.

Bjorksten Opens New Laboratory

Bjorksten Research Laboratories for Industry, Inc., announces the recent opening of its new Texas laboratory. Located in Houston, this laboratory will conduct sponsored industrial research for the many companies located in the rapidly expanding chemical and industrial area of the Southwest. Luther L. Yaeger, vice president, will be in charge.

FEMA Introduces Technical Abstract Service

A new service to members of the F.E.M.A. is being started by Dr. David Jorysch and members of the Abstracts Sub-Committee, of the Scientific Research Committee. J. A. Bouton, Jerry Di Genova, Samuel Lee, Claude Gortatowsky and Harris Shore do the abstracting from Journals of interest to the flavor industry.

Glycerine Producers Report Sales High

Clean America Keeps Clean! Reports from manufacturers participating in the Quarterly Sales Census conducted by the Association of American Soap and Glycerine Producers, Inc., and representing a very substantial portion of the industry's volume, indicate that the sales of soap and synthetic detergents for the first six months of 1957 held the same high level established during the first half of 1956 which was a record period for the industry.

For the first half of 1957 total soap and synthetic detergent tonnage sales amounted to $1,993,436,000 pounds, 1.6% under sales for the same period a year ago. Dollarwise total sales for the first half 1957 amounted to $476,949,000, compared to $456,765,000 in the first six months last year.

Sales of synthetic detergents, solids and liquids, representing 70.4% of the total market amounted to 1,403,557,000 pounds valued at $323,648,000, up 2% over 1956 in tonnage and 6.9% in dollar value. Sales of liquid synthetic detergents, continuing expansion, recorded a 24% increase over the first six months 1956.

Soap sales, solids and liquids for this first half period amounted to 589,879,000 pounds, off 9.2% from the first half 1956 and with a dollar value of $153,301,000, off ½% from last year.

Reports Published on Packaging and Materials Handling

A catalog of 118 technical reports in the field of packaging and materials handling in the collection of the Office of Technical Services, U. S. Department of Commerce, has been published. Some of the reports listed are the results of research performed by Government laboratories.

Gathered around Paul Carey, general manager of Tussy Cosmetiques, are executives and sales representatives of Tussy, shown at the luncheon held in New York, which concluded Tussy's bi-annual round of sales meetings. Seated left to right are: Seymour Kent, Ralph Kleinschmidt, Paul Carey, Gerry Cannon, David Strousse. Standing are: Jack Thomas, Frank Vella, Philip Eisenhart, Lee Smith, Charles Nealis, LeRoy Block, Teresa Hinz, Joseph Donavan, and John Farrell. The luncheon concluded a series of meetings held in Los Angeles, Atlanta, Chicago and New York. The company's sales objectives and advertising plans for the remaining six months of 1957 were presented.

Devlin Named Fellow of Royal Institute of Chemistry

Liam St. J. Devlin

Liam St. J. Devlin, a director of the Melina Laboratories of M. Atkins, Ltd., of Cork, Ireland, has been elected a Fellow of the Royal Institute of Chemistry. Associated with Melina Beauty Preparations, the Irish Cosmetics of the higher price range, Mr. Devlin was responsible for the first production in Ireland of Royal Jelly Cosmetics. He is an active representative of Irish Industry and is a past Chairman of the Regional Group of the Federation of Irish Manufacturers and is the representative of Industry on the Cork Harbor Board.

Aerosol Techniques, Inc. Awards Research Grant

Dr. Ivor Griffith, president of the Philadelphia College of Pharmacy and Science announces the award of a grant by Aerosol Techniques, Inc. The grant was made to the Department of Pharmacy which recently installed an aerosol laboratory.

Sixth Annual Sales Clinic in N. Y.

How to get that order will be told to chemical salesmen by three vice presidents of leading chemical companies at the sixth annual sales clinic of the Salesman's Assn. of the American Chemical Industry, October 4, at Hotel Roosevelt in N.Y.C.

Dodge & Olcott Develops Cocoa-Van

Just released by the Dodge & Olcott flavor laboratories, is a new chocolate-vanilla flavor in powdered form, called Cocoa-Van. Cocoa-Van was developed by D&O in response for a better flavored synthetic chocolate coating.

DuBarry Announces New Perfume

DuBarry has announced the introduction of a new perfume and a complete fragrance line Seven Winds. Seven Winds will be inaugurated with a full scale promotion campaign starting in October. The New Yorker will dramatize the theme . . . Seven Winds . . . Wear it and you stir up a storm.

Robert W. Gilvey Joins Tombarel Sales

Robert W. Gilvey

Robert W. Gilvey has joined the Tombarel, Metropolitan Area, Sales Staff. Previously, he had spent seven years with Colgate Palmolive Co. Most of his time at Colgate was spent as the liaison between purchasing and perfumery dept. where his background work with essential oils was formed.

Science Day Exhibit Planned

A science day exhibit is planned by the Philadelphia College of Pharmacy and Science for Friday evening Nov. 1 and Saturday afternoon Nov. 2. The entire college including the laboratories will be open for inspection and members of the faculty will present demonstrations of equipment and techniques of pharmacy, bacteriology and chemistry.

Marcel Billot Guest of Honor

Marcel Billot, honorary president of "Societe Technique des Parfumeurs de France" and manager of Houbigant in France, was the guest of honor at a dinner given August 29th at "Le Chateau" of the Hotel Savoy-Plaza. The hosts were the directors of the American Society of Perfumers and the French group known as "Les Amis de Langue Francaise de la Parfumerie," under the co-chairmanship of Jean Martin and Pierre Bouillette. Following the dinner, Franco-American humor contributed to the gaiety and success of this affair.

Clairol Celebrates Silver Anniversary

The 25th anniversary edition of Clairol News has been published, featuring "The Clairol Story: 25 Years of Progress," an informative review of hair coloring in the United States, along with Hair Fashion Previews.

Lingle Given Increased Responsibilities at P&G

Increased responsibilities within the Procter & Gamble organization for executive vice president Walter L. Lingle, Jr., were announced by Howard J. Morgens, president-elect. Effective immediately, Mr. Lingle will be assigned the responsibility for P&G's Toilet Goods Division and Paper Products Division, in addition to his present responsibility.

Looking it Over—the new DuBarry perfume and fragrance line Seven Winds recently introduced at the Warner-Lambert Sales Conference, are Joel Lund, Lambert-Hudnut President; Irving Linnard, Lambert-Hudnut v.p. in charge of operations and Charles A. Pennock, Lambert-Hudnut v.p. in charge of cosmetic sales.

Howard J. Morgens Elected P&G President

Howard J. Morgens was recently elected president of The Procter & Gamble Co. Mr. Morgens will assume the office October 1st, when Neil McElroy's resignation will be effective. Mr. McElroy nominated by President Eisenhower and confirmed by the Senate to succeed Charles E. Wilson as Secretary of Defense.

The election of Mr. Morgens moved him to the presidency after nine years as vice president including three as vice president in charge of the larger portion of the company's operations in the United States. Mr. Morgens joined Procter & Gamble as a salesman in 1933. In 1934 he transferred to the brand promotion section of the advertising department and in 1946, after advancing through advertising and promotion work, was named manager of the advertising department. The same year he was made a member of the company's Administrative Committee. In 1948 Mr. Morgens was made vice president in charge of advertising and two years later was named a member of the board of directors.

AMA to Give Cost Reduction Course

More than 250 cost-conscious executives are expected to participate in the American Management Assn's Cost Reduction Course during the current fiscal year. The one week course for production executives who supervise foremen will be given eight times between now and June, in New York, Chicago, Los Angeles, and San Francisco.

Hoffmann-LaRoche Announces Name Change

Hoffmann-LaRoche Inc., has announced that the pharmaceutical division of the company will now be known as Roche Laboratories, a division of Hoffmann-LaRoche Inc. The corporate name of the company will continue the same. The other divisions of the company, including the aromatics division, will continue to use the corporate name of the company.

Wyomissing Paper to Merge with The Narrow Fabric Co.

The Wyomissing Glazed Paper Co. and its wholly owned subsidiaries, Reading Glazed Paper Corp. and The United Mfg. Co., announced a merger The Narrow Fabric Co. All operations of the three paper companies will be conducted under the name of Wyomissing Paper Products Division of The Narrow Fabric Co.

R. S. Aries Moves To New Quarters

The chemical consulting firm of R. S. Aries & Associates is now located at new and enlarged quarters in Stamford, Conn., having moved from its old address at 41 East 42 st, NYC.

Wilson Plastics Moves Offices

The Wilson Plastic Container Corp. recently moved its general offices and show room to 25 North Third Street, Brooklyn 11, N.Y. The telephone numbers are unchanged.

Helen Neushaefer Announces Shade Selector Chart

Helen Neuschaefer, Inc. announces a new shade selector chart. Focal point is a full color illustration of Helen Neushaefer. The shade selector incorporates the current 11 shades of Helen Neushaefer #139 Lipstick with Lasteen; 14 shades of #10 regular Nail Polish; 4 shades of #20 Iridescent polish.

Fortescue to Head Ungerer Philly Office

Joseph L. Fortescue was recently appointed by Ungerer & Co. as manager of the Philadelphia office in charge of

Joseph L. Fortescue

sales and customer service in that territory. Mr. Fortescue has had over thirty years experience in the fields of essential oils and aromatic chemicals.

Kaye & Associates Named Representatives for Rayette

Ralph E. Kaye & Associates have been appointed sales representatives for the Chemical Division of Rayette, Inc., manufacturer of cosmetic chemicals.

Chemical Industries at 1958 Brussels Exhibition

By the terms of the agreement concluded between the Chemical Industries Group and the Government's Commissariat-General for the Exhibition, two sites have been set aside for this Group, which is building on them two pavilions having an area of 5,025 square yards and 2,750 square yards respectively. The smaller building is reserved for exhibitors from the soap industry, which will occupy an area of about 2,030 yards. The larger building will be used for other divisions of the Chemical Industries Group.

Anatole Robbins Shows Laguna Make-up on TV

Cosmetics took a new promotion turn on Los Angeles' KTTV Jackson Wheeler show recently, with a behind-the-scenes look at the famed Laguna Pageant of the Masters. Step by step, television audiences watched the transformation of a painting, "The Cardinal's Portrait" into a living replica, through the application of make-up.

Shown on TV—Make-Up Art for Laguna Festival. From left to right are: Donald A. Breyer, president of Anatole Robbins; Lee Hutchings of Anatole Robbins, make-up consultant for the Festival; L. L. Parkinson; Mrs. Anatole Robbins.

Volume 29 of Dechema-Monographs Published

Volume 29 of the Dechema-Monographs, which are devoted to Research and Development in the chemical apparatus and equipment field, deals with Chemical Technology and contains verbatim reports of the 19 lectures that were delivered on the occasion of the Annual Meeting of the Dechema for 1956, held in Frankfurt (Main). In some cases the text includes information and data supplemental to the original text. Leading Articles by W. Fuchs, Aachen; F. Garner, Birmingham; M. Letort, Paris; F. Patat, München; K. Schoenemann, Darmstadt; K. Winnacker, Frankfurt (Main)-Hoechst and other well-known authors stress the importance of Chemical Engineering in the field of modern research in a most impressive manner.

Givaudan-Delawanna Offers New Aromatic Chemical

Another contribution in the field of synthetic aromatic chemicals has been announced by R. E. Horsey, vice president in charge of sales of Givaudan-Delawanna, Inc. This new chemical, to be offered under the tradename Lilial, is a pure aldehyde with, according to the manufacturer, a powerful and diffusive odor recalling linden blossoms and fills the need of the perfumer for a floral component having a smoothness and intensity together with unusual stability.

Houbigant to Sponsor Color TV Show

One of the first color television series ever filmed is a highlight of the 1958 advertising plans of Houbigant Sales Corporation. The venture is the first major television effort for the company and the most ambitious program to date in the toiletries and perfume field.

The 13-week series of quarter hour programs will be entitled "How To Arrange Flowers" and will feature J. Gregory Conway, widely known floral artist and author of numerous books on flower arrangement.

In the new television series, each program will cover one well known garden flower and show various ways to arrange it—alone and in combination with other flowers. There will be two commercials on each program, and the products to be advertised are the Quelques Fleurs bath line, Chantilly and Flatterie perfume with the new Hermetique atomizer, Golden Touch perfume purser, and Chantilly liquid skin sachet.

Pierre Harang, vice president and director of Houbigant, is now in Hollywood for the filming which is taking place at the Metro-Goldwyn-Mayer Studios.

Colt's Plastics Co. Moves Offices and Plant

The Colt's Plastics Co., Inc., has announced the relocation of their offices and plant from Hartford, Conn., to North Grosvenordale, Conn.

Northam Warren Corp. Awarded Safety Plaque

Over one-half million man hours without a lost time accident has resulted in the awarding of a plaque of merit to the Northam Warren Corp. by the Liberty Mutual Insurance Co.

During the eight months period, Oct. 1, 1956 to May 1, 1957, the company ran a total of 549,755 man hours without a time loss accident. The photo shows Mr. Banville, senior safety engineer of the Liberty Mutual Insurance Co., awarding the plaque to James L. Gilligan, superintendent of plant operations. Looking on are Elizabeth Scully, plant nurse, and Karl W. Illigen, vice president and secretary of the firm.

Seventeen Magazine Offers Beauty Workshop Course

Seventeen Magazine's annual October beauty issue will inaugurate two new services for America's teen-age girls. The first is a beauty workshop course to be offered through leading department stores, and the second, a home beauty workshop course in the form of a 60 page, 8 lesson booklet, listing 15 top fragrance and cosmetic manufacturers who will supply special free samples, brochures and charts.

I. C. C. Grants Railroads Freight Rate Increase

The Interstate Commerce Committee has granted a 7% increase in freight rates to the Eastern and Western Railroad Carriers and 4% increase to Southern Carriers, which is expected to become effective within the next few weeks. The Committee denied the original demands of the railroads for a 22% increase for the Eastern and Western Carriers and a 15% increase for the Southern.

Geoffrey Sladden of London, manager of Shulton (Great Britain) Ltd., subsidiary of Shulton, Inc., reviews merchandising and advertising program for the Fall with international division sales manager Fred Rowe, left, and advertising manager Claude Forter, right. The new subsidiary will make the Old Spice for Men line of products available in England for the first time.

Helena Rubinstein Helps Teen-Ager Win Trip

Excited and full of happy anticipation of their two-week trip to Europe, Sandra Nicholson and her mother, Mrs. F. C. Nicholson of Albany, N. Y., check their schedule for the last time at Idlewild airport just before boarding the B.O.A.C. plane to London. Sandra was the winner of a "Girl with the American Look" contest sponsored by Helena Rubinstein. Sandra's prizes included an all-expenses-paid trip to Europe and a wardrobe of Betty Barclay dresses and Amco Sportswear clothes.

One of the happiest and most excited teen-agers on the Eastern seaboard these days in Sandra Nicholson, of 647 Western Avenue, Albany, N.Y. She is off to Europe in a BOAC super-service Stratocruiser August 10th for a glorious two-week visit, complete with a fabulous fashion wardrobe. And it all started with her registration in a Helena Rubinstein Charm Course for teens at W. M. Whitney and Company, in her own home town!

During the past seven months the famous beauty authority sponsored a "Girl With the American Look" contest through the medium of the Charm Course for teens which was presented in department stores across the country. From each class a girl was chosen for her outstanding beauty, good grooming and personality. These regional winners were featured in full page color ads in Seventeen Magazine—and from them the readers of this popular publication chose Sandra as the final winner, by an overwhelming vote.

In addition to Seventeen, Betty Barclay dresses, Amco Sportswear and the British Overseas Airways Corporation co-operated with Madame Rubinstein in the promotional contest.

Sandra is truly a "girl with the American look." She is 5 feet 4½ inches of youthful blonde beauty, vivacious and friendly. Seventeen years of age, she would like to model, but is currently studying merchandising at Green Mountain Junior College.

Sandra's mother will travel with her, and they had an exciting few days in New York City, where Helena Rubinstein arranged publicity appearances for the teen-age beauty, before their take-off for Europe.

Max Factor's "Guess Miss Universe" contest staged in over 3000 Southern California retail stores during the world-acclaimed Miss Universe Beauty Pageant, which Factor co-sponsored, is one of the success stories of the year. Lavish window displays like this one at the May Company-Lakewood brought customers streaming to the cosmetic departments to enter the contest. First prize, an Austin-Healey 100-Six sports car, and second prize, a Fleetliner P-12 and Scott-Atwater outboard motor, decorated the interior and windows of many of the leading stores.

Syntomatic Introduces Micromatic-Captive Flavors

For food processors as well as for pharmaceutical manufacturers who are interested in dry, powdered flavors, Syntomatic Corp. has produced a new line of such materials called Micromatic-Captive Flavors. These flavors range all the way from Apricot to Vanilla and include both natural and imitation flavors. Because Micromatic-Captive Flavors are flavors in powder form, they can be incorporated into dry powder products such as cake mixtures, puddings, beverages and pharmaceutical powders and tablets.

OBITUARY

Charles C. Concannon

Charles C. Concannon died August 9th at the age of sixty-eight. Mr. Concannon organized the chemical division of the Bureau of Foreign and Domestic Commerce in 1922 and headed this division for twenty-eight years. His retirement in February was due to ill health.

Alfred E. Weyand

The National Chemical Credit Assn. has announced the death of Alfred E. Weyand, general credit manager of American Cyanamid Co.

SPOTLIGHT News...

A new instant orange flavored breakfas: beverage called Tang, a powder which mixes readily in cold water is being market tested by General Food Corp.'s Post division. It comes in 7 and 14 oz. jars.

Colgate Palmolive Co. has revised its pacts in North Carolina to enable stores which do not offer trading stamps to compete with those which do. The company allows a 3% discount to retailers who do not issue stamps.

Pierre Chauvet et Cie, Seillans, Var, France, producers of raw materials for perfumery will be represented in the United States by the Polarome Manufacturing Co., New York, N. Y.

The first beauty aid show in Delaware Valley was held at the Sheraton Hotel, Philadelphia, Pa., September 4, 5 and 6 under the sponsorship of the Philadelphia Inquirer. Called the Beautyrama the show consisted of beauty clinics and demonstrations of beauty care. About 25 manufacturers had exhibits.

The National Wholesale Druggists Assn. is to hold its annual convention in Bal Harbour (Miami), Florida October 26-31.

Revlon will spend more money for printed advertising this autumn and during 1958. It has already doubled its 1957 newspaper advertising over 1956. This year's print allocation will represent about 35% of its $15,000,000 advertising budget with newspapers receiving 50% of the total print expenditure. Sales are expected to reach an all time high following a $47,000,000 volume for the first six months of this year.

Normal and Abnormal aspects of the skin are to be covered in a two-day symposium before the Medical Sciences Section of the American Medical Assn. in Indianapolis, Ind., December 28 and 29. The program has been arranged at the invitation of the American Assn. for the Advancement of Science. The Committee on Cosmetics in co-sponsorship with the Society of Investigative Dermatology will present the symposium. It will be divided into four major sessions: 1. Integument as an Organ of Protection; 2. Circulation and Vascular Reactions; 3. Sebaceous Gland Secretion; and 4. Pathogenic Factors in Pre-Malignant Conditions and Malignancies of the Skin. Dr. Stephen Rothman of Chicago will serve as chairman of the symposium. Full information about the symposium may be had by writing to Mrs. Veronica Conley, secretary, Committee on Cosmetics, American Medical Assn. 535 N. Dearborn St., Chicago 10, Ill.

What is small business? asks the NWDA Newsletter. Of approximately two and a half million establishments in the United States, 99% have less than 50 employes. These include retail, wholesale and service establishments. Of approximately 285,000 manufacturing establishments in the United States, 82% have less than 50 employes and 98% have less than 500.

No action was taken by Congress on any of the chemical additives bills before its adjournment. The T. G. A. favors the bill introduced by Rep. John B. Williams as the most satisfactory to the industry in view of the fact that it is practically certain that a chemical additives bill providing pretesting of ingredients to be used in cosmetics is almost certain to be passed sooner or later. Also legislation over the labeling of household chemical compounds now on the market will have to wait until the next session.

The tenth Nat'onal Chemical Exposition, sponsored by the Chicago Section of the American Chemical Society was held September 9-12 in the International Amphitheater in Chicago.

Gillette Co. is to offer a cough remedy through Gillette Laboratories a new division in Chicago. A manufacturing arrangement has been completed with the Upjohn Co. This will mark the entry of the safety razor and cosmetic company which also controls the Toni Co., into the proprietary medicine field.

Bristol-Myers Co., New York, may merge with Grove Laboratories, St. Louis, Mo., if negotiations now underway are concluded. Grove Laboratories manufacture Kare lotion deodorant, Fitch's dandruff remover shampoo, Fitch's hair tonic and cold tablets and remedies.

Lightfoot Schultz Co., Hoboken, N.J. has changed its name to the Lightfoot Co. The company manufactures soap and soap products.

Availability of Anethole U. S. P. XV Extra in commercial quantities has been announced by the Southern Chemical Division of The Glidden Co., Jacksonville, Fla. The development is expected to be of particular interest to perfume and flavor chemists. The olfactory value of the new product has been improved it is reported as it is completely free of cisanethole, methyl chavicol, terpineol and other alcohols. Full details may be had by writing to the company at P. O. Box 389, Jacksonville, Florida.

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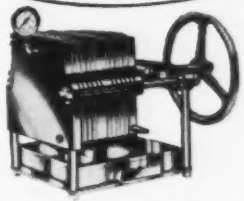

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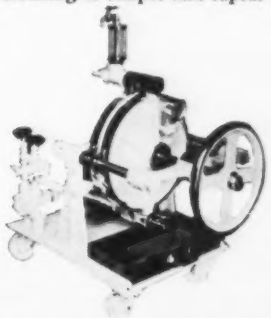

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Perfume Importation: A Monopoly

Decision of U. S. District Court likely to affect distribution patterns in United States of all foreign perfumes

ALBERT WOODRUFF GRAY, A. B., L. L. B.

Judge David N. Edelstein of the U.S. District Court for the Southern District of New York in a decision July 8 on the complaint of the Justice Department that Guerlain, Inc., Parfums Corday, Inc. and Lanvin Parfums Inc. and their related producers of perfumes in France were violating Sec. 2 of the Sherman antitrust law, held that Sec. 526 of the Tariff Act could not be invoked to bar imports by third parties of branded perfume from the three related French companies.

It is reported that the Justice Department has filed proposals for a final judgment and that the defendant companies will file counter proposals. If an injunction is decreed on the final judgment an appeal to the U. S. Supreme Court is expected to be taken because of the likelihood that importing operations by third parties, mail order or otherwise, could affect the price structure of the three companies and might generally force a change in perfume distribution patterns. In his opinion Judge Edelstein said:

"I have found as a fact in each case, beyond any gnawing doubt, that the defendant and its French counterpart constitute a single international enterprise. The companies with varying degrees of vigor deny integral existence with their foreign associates but an examination of the facts leaves the denials utterly unconvincing.

"The asserted independence is contrived and the 'corporate veil' is easily pierced by the merest glance through the forms of the business organizations to the realities of the relationships."

Each of these companies obtained either in packaged form or in bulk, perfumes, toilet waters and similar products from French producers which they in turn sold in this country under the trade-marks used by these French manufacturers. These names have been originated by the foreign producers who first marketed the goods of their manufacture under secret formulas.

In each instance the French producer has given to its associated American company, not only the exclusive right to distribute its products but transferred as well its trade-mark rights which had been registered in the United States under the name of the American company as owner.

It is provided in the Federal antitrust statutes. "Every person who shall monopolize or attempt to monopolize, or combine or conspire with any other person or persons, to monopolize any part of the trade or commerce among the several states or with foreign nations, shall be deemed guilty of a misdemeanor."

Related here to the application of this provision to the circumstances of the toilet goods importations of these companies is a further provision of the Federal statutes that is, in part:

"It shall be unlawful to import into the United States any merchandise of foreign manufacture if such merchandise, or the label, sign, print, package, wrapper or receptacle bears a trade-mark owned by a citizen of, or by a corporation or association created or organized within the United States * * * unless written consent of the owner of such trade-mark is produced at the time of making entry."

Obviously as a consequence of this trade-mark provision, no one except these associated companies may import the perfumes and other toilet goods of their respective French manufacturer under the trade name by which the goods are known. Neither can a competitor in this country, purchasing such goods abroad, sell them in this country under the trade name that represents the goods to the purchasing public without violating this trade-mark provision of the Federal statutes.

In its decision of this recent case in which these

continued on page 92

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PERSONALITIES

Clarke C. Hambley

Clarke C. Hambley has been elected to the post of vice president in charge of promotion of Prince Matchabelli-Seaforth, according to a recent announcement by Owen Stoner, president of the firm. Mr. Hambley joined the firm in 1950 as assistant advertising manager, later was made advertising manager and then merchandising manager.

Pierre Bruell of the Polarome Manufacturing Co. has just returned from a three week visit to Chauvet & Co. in Seillans and an extensive tour of their plantations in various parts of the French Alps, where the new crop of Lavender and Lavandin is now being gathered. This visit was made in connection with the appointment of Polarome Mfg. Co. as the U.S. representative of Pierre Chauvet & Co. of Seillans.

Richard C. Pisano

Richard C. Pisano, a graduate of the Wharton School of Finance and Commerce, University of Pennsylvania, has been appointed sales manager of Citrus & Allied Essential Oils Co. Mr. Pisano has just returned from active duty with the army.

Dr. Richard Lehne

Dr. Richard Lehne is now the associate director of technical research for the Wildroot Co., with special responsibility for the research and development of new products. Dr. Lehne started with Wildroot as a research chemist in 1952. He was graduated from Muhlenberg College in 1941 and holds a Ph.D. degree from Yale University in organic chemistry. Dr. Lehne is a member of the Society of Cosmetic Chemists and the Sigma Xi Honorary Chemical Society.

Paul P. Wollard

Paul P. Wollard has been elected to the post of vice president in charge of sales of Prince Matchabelli-Seaforth according to an announcement by the firm. Mr. Wollard joined the firm in 1950 as a salesman, later was made assistant sales manager and then general sales manager.

Edward A. Gumpert has been appointed to the position of general product manager of the Toilet Articles Division of Colgate-Palmolive Co., according to an announcement by C. G. Grace, vice president in charge of the division.

George Silver

George Silver, who has recently joined the Polak & Schwarz organization, will concentrate on sales for the recently expanded Industrial and Odormasking Division. He was formerly in the textile dyeing and paint industry and is well acquainted with technical problems in the chemical field.

C. Gilbert Green has been appointed general sales manager of the Toilet Articles Division of Colgate-Palmolive Co. At the same time, it was announced that H. P. McClure was named to the newly-created position of general sales and promotion manager of Food and Drug Store Chains.

The two men selected for these key positions within the division have a combined service of more than 60 years in Colgate sales.

Emery A. Emerson

Emery A. Emerson has been appointed to the post of supervisor of quality control in the Wildroot Co. His duties in his new position will involve full responsibility for the control and analysis of all raw materials and finished products, including packaging.

companies were held to be violators of the antitrust act, the court referred to a similar incident involving the application of this trade-mark provision in which a dealer in this country had imported in bulk from France face powder sold in America by Bourjois Inc. under its trade name of "Poudre Java," and marketed the product so imported under the name of "Poudre de Riz de Java."

In granting an injunction in this instance against these sales by this competitor of Bourjois of its "Poudre de Riz de Java," albeit the product sold was the same as that sold by Bourjois as "Poudre Java," the Supreme Court of the United States said:

"Ownership of the goods does not carry the right to sell them with a specific mark. It does not necessarily carry the right to sell them at all in a given place. If the goods were patented in the United States a dealer, who lawfully bought similar goods abroad from one who had a right to make them and sell them there, could not sell them in the United States.

"The monopoly in that case is more extensive but we see no sufficient reason for holding that the monopoly of a trade-mark, so far as it goes, is less complete. It deals with a delicate matter that may be of great value but that is easily destroyed and therefore should be protected with corresponding care.

"It is said that the trade-mark here is that of a French house and truly indicates the origin of the goods. But that is not accurate. It is a trade-mark of this dealer only in the United States and indicates in law, and, it is found, by public understanding, that the goods come from the dealer although not made by it. It was sold and could only be sold with the goodwill of the business that the dealer bought."

In this recent case the French manufacturers had in each instance given to their American associate the exclusive right to distribute its product and transferred to the American company trade-mark rights sufficient to justify registration in the Patent Office on the basis of ownership.

This the government contended was not only an unwarranted implementing of this trade-mark provision of the Federal statute but was a violation of the antitrust laws. According to the argument of the government in this case this was, "An attempt to monopolize and a monopolization of the importation into and a sale within the United States of these trade-marked products by preventing the importation and reselling by others who purchase such goods from the French producers, that forms but the foreign part of a single international enterprise."

In its conclusion holding these companies guilty of a violation of the antitrust act the court said, "What is under attack is in fact an attempt, successfully executed, by each company, as a part of a single international business enterprise, to limit the resale of its products for the express purpose of excluding competition and controlling prices.

"Purchasers from the French part of the enterprise are prevented by means of the utilization of this statute from competing in the United States with the American part of the same enterprise. Such exclusion, if it were accomplished by agreement, would violate the Antitrust Act."

REFERENCES

United States v. Guerlain et al., 1957 Trade Cases, 68,771: U. S. Dist. Ct., New York, July 9, 1957

Bourjois & Co. v. Katzel, 260 U.S. 689, January 29, 1923

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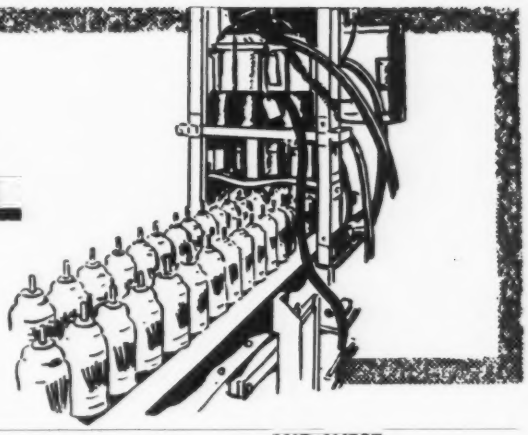

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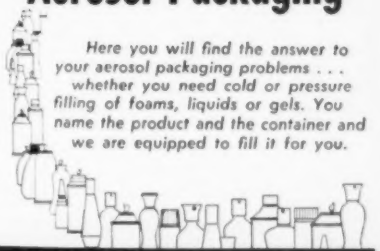

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MARKET REPORT

Citrus Oils in Demand

A note of optimism prevails in essential oils, aromatic chemicals and closely related articles as the period approaches when makers of toiletries, perfume compounds, proprietaries, and other consumer items normally appear in the market for their anticipated Fall and Winter requirements. A bright spot in the market, particularly with respect to chemicals and oils used in colognes and toilet waters is the realization for the need of an educational consumer program stressing the advantages in using pressurized products in this field. Summer demands for citric acid, citrus oils, fruit flavors and other products for beverages, confections and certain foods have been running into considerable volume.

PRICE CHANGES

Advances	Current	Previous
Balsam, Peru	$ 1.60	$ 1.35
Tartaric Acid, imported	0.40	0.38
Oil lime, distilled	5.85	5.00
Oil orange, Floridian	0.60	0.50
Cocoa butter	0.80	0.75
Copra, coast, ton	160.00	151.00
Coconut oil, crude, N.Y.	0.12⅞	0.12⅛
Tallow, fancy	0.08⅜	0.08¼
Red oil, tanks	0.17	0.15¾
Declines		
Oil bois de rose, So. Am.	$ 3.10	$ 3.35
Oil sandalwood	13.25	13.75
Oil eucalyptus, 70-75%	0.65	0.70
Oil sassafras (camphor 1.070)	0.45	0.48
Caffeine		
Anhydrous	2.50	3.00
Hydrous	2.33	2.80
Corn oil, crude	0.13	0.14⅛

(Prices per pound unless otherwise specified)

LIME ADVANCE EXTENDED—

The upward price trend in oil lime was further extended over the past month with distilled oil rising to a new high of $5.85 to $6.25 per pound. A factor behind the firmness in the market was the general realization that this years crop in Mexico was not only late but that it would be smaller than last year. Late advices from Mexico state that the balance of this years production is entirely sold. There appears to be little hope for any relief in the tight market since most all of the oil produced in the West Indies is exported to countries other than the United States.

GLYCERIN TONE MIXED—

There is considerable speculation in trade circles as to whether glycerin prices will be maintained over the remainder of the year. Foreign crude is arriving here at a cost of about 15 cents a pound at refiners plants. It is believed that this price will force the domestic price of crude of 16 cents to a lower level. Whether the drop in crude will prove sufficient to affect refined prices remains to be seen. Meanwhile domestic stocks remain close to the highest level in years despite the fact that they have leveled off somewhat from the April level of 71 million pounds.

MINT OIL PRODUCTION—

Output of oil peppermint from the 1957 crop is estimated at 2,317,000 pounds, below last years record high of 2,326,000 pounds, but 41 percent above average. This year's output of oil spearmint is placed at 597,000 pounds or approximately 10 percent below last years production. The stands were found to be more uniform than last season. In Washington where 50 percent will be harvested, crop conditions were found to be the best since production started in 1952.

FLORIDIAN ORANGE FIRMS—

A feature of the orange oil market was an advance of 10 cents per pound in Floridian orange oil prices. While this variety of oil normally shares in a seasonal upturn in oil consumption over the summer months, demands this year have been pressing more heavily on the market in the light of the tight supply position that has existed in Californian orange oil. The advance in the Floridian oil established prices at 60 to 65 cents per pound.

TARTRATES STRONG—

The domestic market for tartaric acid is strong and prices for imported material are slowly edging upward. The firmness in domestic acid is supported by good seasonal demands and steadily rising costs of crude material, argols. New and higher prices for imported tartaric acid range from 40 to 42 cents per pound with importers stating that the higher levels are still close to replacement costs.

ALCOHOL POSITION CLOUDED—

The purchase of a surplus of Cuban molasses together with negotiations for the purchase of a portion of next years crop at a price of 10¼ cents a gallon has served to lessen the possibilities of an early advance in ethyl alcohol prices. Earlier in the year Cuba was selling molasses at 20 cents a gallon, a figure which was said to be far too high for use in alcohol production in this country. While synthetic alcohol from the petroleum industry has cut into markets formerly supplied by makers of fermentation alcohol a large portion of the crude material from which synthetic alcohol is made has been going into other end products at better prices.

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Balsam that is imported from El Salvador experienced one of its sharpest advances in price in some time. Prices jumped from a range of $1.35 to $1.40 to $1.60 to $1.75 per pound, and the higher prices were largely nominal by reason of the complete absence of additional supplies. Sudden buying orders for the account of consumers and some speculative interests suddenly brought out the fact that stocks here and in the primary center were at an extremely low level.

SANDALWOOD QUIET—

The recent easier trend in sandalwood was in sharp contrast to the hardening trend of prices noted a month ago. For a time prices were headed toward higher levels on reports to the effect that Russia had purchased a sizeable quantity. The reversal in the early upward trend appears to indicate that Russian purchases had not materialized.

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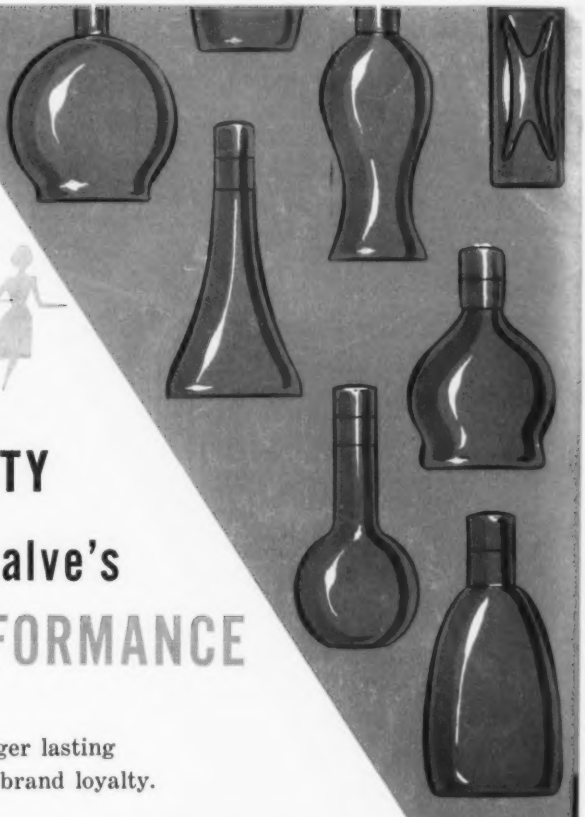

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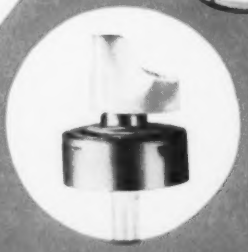

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